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# ROCK PRODUCTS

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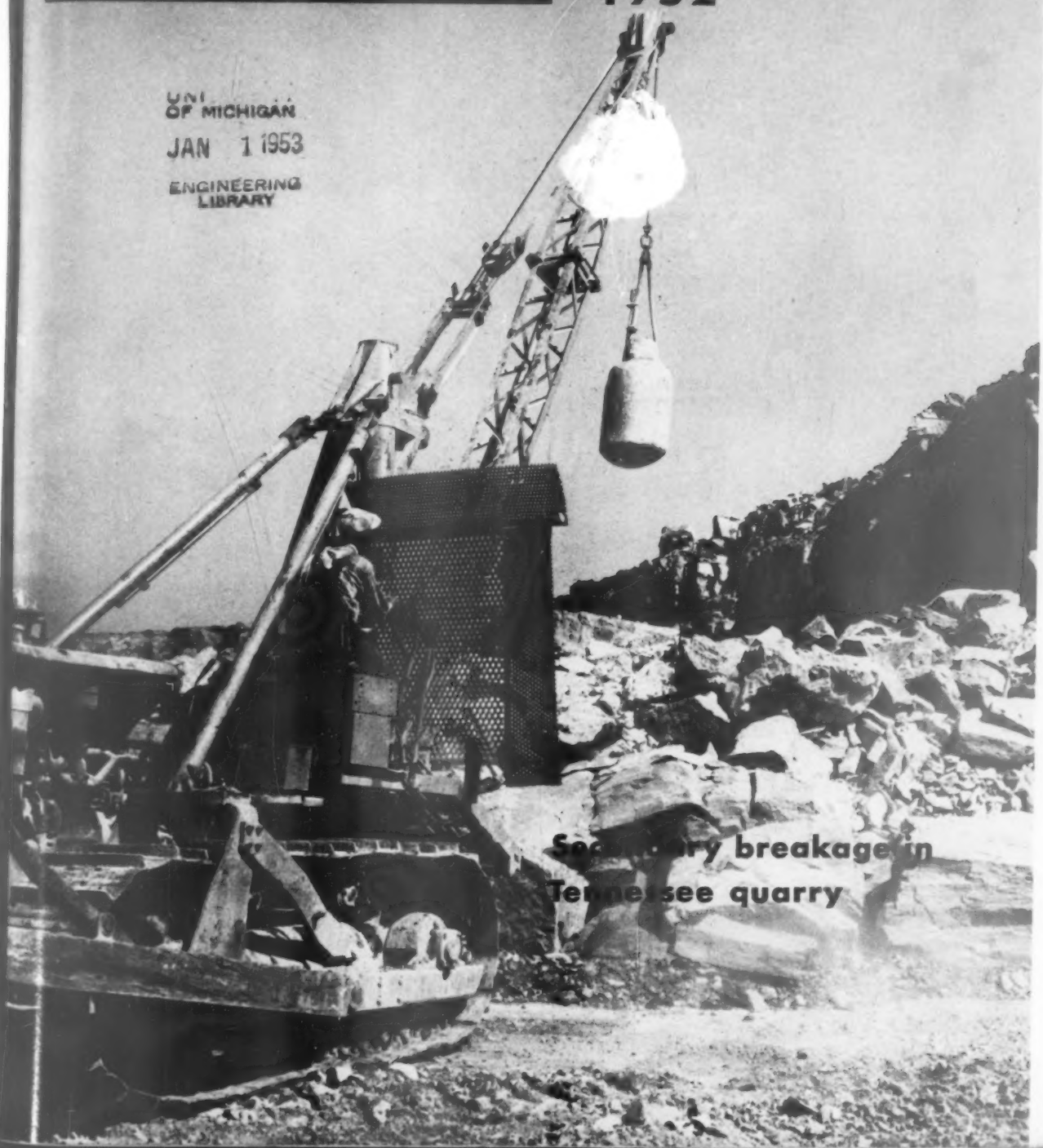

Secondary breakage in Tennessee quarry

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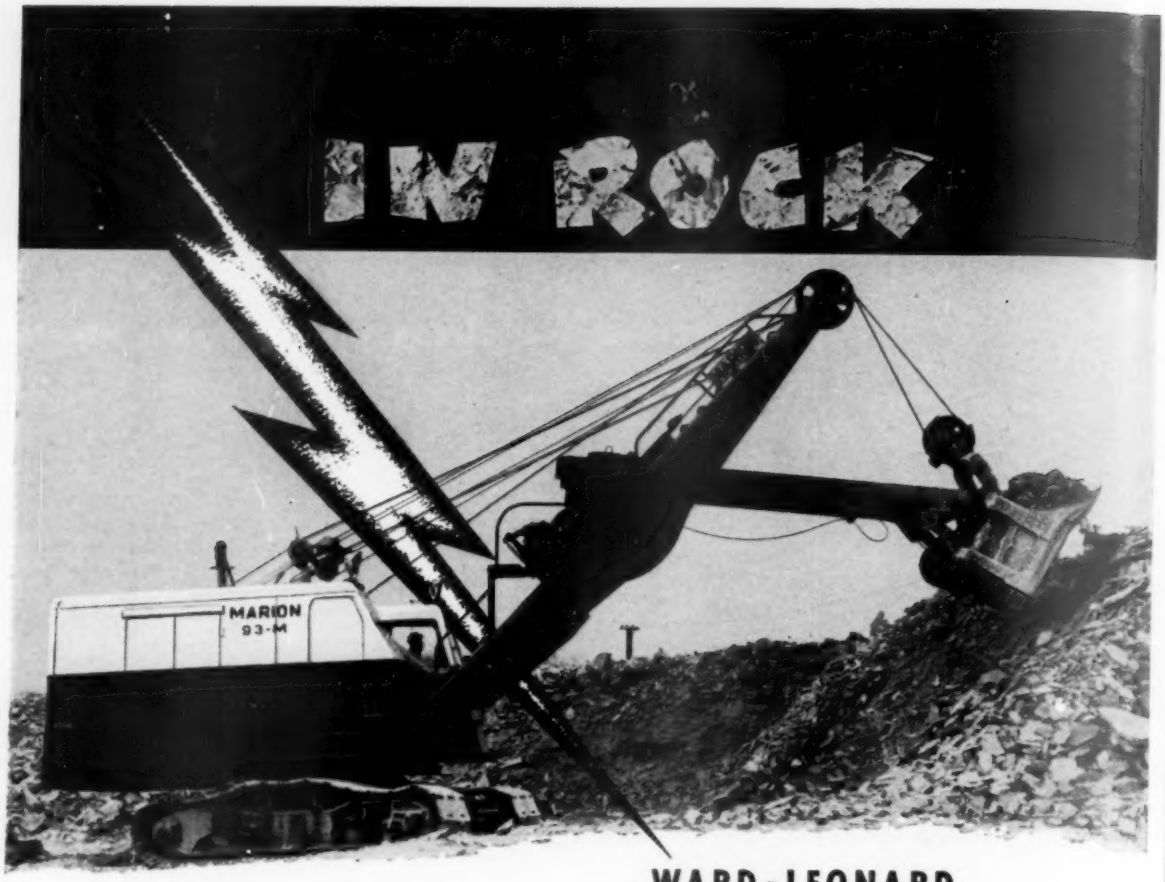


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# ROCK PRODUCTS

DECEMBER, 1952 THE INDUSTRY'S RECOGNIZED AUTHORITY VOL. 55, No. 12



**Bror Nordberg**
*Editor*

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*Editorial Consultant*


## This Month


**We Hear** 37

**Editorial—Specifications can be the means of enduring prosperity to an industry** 67

**Rocky's Notes—Chemistry of the soluble silicates** 69

**Labor Relations Trends** 71

**People in the News** 73

**Industry News** 77

**Hints and Helps** 80

**New Machinery** 82

**First New England Cold-Mix Asphaltic Concrete Plant** 88
California-developed process is installed at plant of Dunning Sand and Gravel Co., Wauregan, Conn.

**Holly and Sand Go Hand in Hand** 90
Holly orchard supplies friends and customers of silica sand producer with Christmas remembrances
*Daniel G. Fenton*

**Crushing Practice and Theory** 91
Part XIII. Selection of quarry equipment for efficient crushing practice
*Brownell McGrew*

**Tips on Repairing Conveyor Belts** 94

**Building Community Good Will** 96

**Dams and the Rock Products Industry** 98
*Walter B. Lenhart*

**Vibrating Conveyors for Clinker** 103

**Small Plant Has High Capacity** 104
Valley Forge Stone Co., Malvern, Penn., uses vibrating grizzly ahead of primary crusher and does not return material
*Walter B. Lenhart*

**Fine Grinding in Tube Mills** 106
*B. M. Pearson*

**Progress Made in Reducing Accidents** 109
National Safety Council holds 40th annual meeting

**Classifying System Anticipates Specifications** 112
New plant of Texas Construction Material Co., at Eagle Lake, Texas was designed to meet any anticipated sand specifications, no matter how strict
*Robert H. Klassner*

**Secondary Collectors for Recovery of Fine Dust** 114
*Ethelyn Weller*

**Nomograph Determines Lime Kiln Performance** 115

**Meeting Fine Sand Specifications** 116

**Aerial Tramway Solves Quarry Transportation Problem** 118
*Charles F. Dwyer*

**Aggregate Production for Canadian Dam** 120

**Lightweight Aggregates from Argillaceous Raw Materials** 122
*F. O. Anderegg*

**Developing a Big Business in a Small Town** 177
Attention to the little details of production, promotion and community relations contributes to excellent sales
*Tip Brown*

**Carolina Pipe Industry Expands** 180
*Walter B. Lenhart*

**Products Output Booms in North Central States** 182
*Robert Foss*

**More Pointers in Plant Planning** 183
A producer views the ready-mixed concrete business—Part III
*James A. Nicholson*

**Western Concrete Pipe Association Holds Fall Meeting** 186

**Breaking Into a Tough Market** 187
Adams Concrete Products Co. uses effective selling methods in making Durham, N.C., a thriving market for concrete masonry



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# "WE HEAR..."

December, 1952

Additional steel allotments are expected to be made available for certain civilian products in the first quarter of 1953. The National Production Authority stated that a survey of steel producers' order books indicates they will be able to fill additional orders during that period. Although N.P.A. didn't indicate for which products additional steel would be granted, industry sources declared that supplies of steel sheet, strip and other light forms would be the first to ease.

* * * * * * * * * *

Construction costs, which reached an all-time high in October, will tend to stabilize near present levels for several months, as predicted by Engineering News-Record. The ENR Construction Cost Index for 20 key cities rose to a record high of 588.43 (1913 equals 100) in October, 0.4 percent higher than September and 7.6 percent above October, 1951. The ENR Building Cost Index of 424.77 for October was also a new high, showing an 0.8 percent increase over September and a boost of 5.3 percent over October, 1951. Higher wage contracts and the recent steel price increase were said to be the chief reasons for the increase in construction costs.

* * * * * * * * * *

A 45-ton crane with a 60-ft. boom recently went out of control while being used in the yards of a Chicago sand company. The crane meandered its own course until it came to a halt 30 ft. under water in the south branch of the Chicago river. The driver escaped injury by leaping from the cab.

* * * * * * * * * *

Available electric power in the U.S. will have increased by 1964 to over four times the amount available at the beginning of World War II, it was recently predicted at the Centennial of Engineering in Chicago. Generating capacity today is approximately 80,000,000 kw., over half of the world's energy output. Installed capacity is expected to increase about 7 percent per year, reaching 160,000,000 kw. by 1964. In 20 years, the installed generating capacity will probably exceed 250,000,000 kw. Much of the increased generating capacity is due to the rapid rise in the size of turbine generators. A few years ago, the largest high-speed generator was rated at 125,000 kw.; units of 250,000 kw. are now on order and, with the development of a new "hollow coil" cooling method, turbine generators of 300,000 kw. are predicted.

* * * * * * * * * *

Construction contract awards in the 37 states east of the Rockies for the first nine months of the year totaled $12,747,791,000, an increase of 2 percent over the corresponding period of 1951, according to an F. W. Dodge Corp. report. Non-residential awards of $5,053,968,000 were down 8 percent; residential awards of $5,098,182,000 were up 4 percent; public and private works and utilities, totaling $2,595,641,000, were up 22 percent. Construction awards for the month of September showed a new surge of building activity with a total of $2,039,203,000, which was a 42 percent gain over August and an 88 percent increase over September, 1951. Non-residential awards showed the biggest gain, with a 145 percent increase over August and a 215 percent increase over September, 1951.

* * * * * * * * * *

The effects of the steel strike during June and July were reflected in new freight car deliveries in September when only 3762 cars were delivered, the lowest since July, 1950, according to Missouri Pacific Lines. Orders for new freight cars totaled 3628 in September. Backlog of cars on order, as of October 1, was 95,377.

## WE HEAR

Steel production in the United States totaled 9,034,000 net tons in September, a new high for a 30-day month, according to the American Iron and Steel Institute. The September output of steel ingots and steel for castings, the highest since March, a 31-day month when 9,404,191 tons were produced, was 535,000 tons above the August total and 373,000 tons above the September, 1951, output.

* * * * * * * * * *

A new atomic plant is to be built in southern Ohio, about 20 miles north of Portsmouth, at a cost of approximately $1,200,000,000. When completed in about three or four years, the plant will produce uranium 235. Expansion of present atomic facilities is also planned, which will bring the government's atomic plant investments to over $6 billion for construction alone. This includes, besides the new Ohio plant, Oak Ridge, Tenn., plant, $464,000,000; Paducah, Ky., plant, $459,000,000; Savannah River, S.C., hydrogen bomb plant, $171,000,000; and Hanford, Wash., plant,$411,000,000.

* * * * * * * * * *

A new product, agricultural frit, is said to supply valuable trace elements to plants through contact with the plant roots, thereby stimulating growth and improving crop yields. The product is expected to be marketed in a combination package with recently promoted soil conditioners.

* * * * * * * * * *

Heavy construction awards, nationally, totaled $13,425,530,000 for the first 43 weeks of 1952, compared with $11,751,415,000 for the corresponding period of 1951, as reported by Engineering News-Record. Awards for public buildings are leading all other types of construction, due primarily to Atomic Energy Commission projects. The 43 weeks' total, amounting to $3,972,700,000, was 114 percent above the comparable 1951 period. Industrial building was 35 percent under the 1951 period. Private mass-housing awards of $2,480,800,000 were 53 percent above the same period of 1951.

* * * * * * * * * *

Certificates of necessity have been granted by the Defense Production Administration to Pathfinder Chemical Corp., subsidiary of Goodyear Tire & Rubber Co., for construction of two projects, totaling $13,953,650, at Point Pleasant, W. Va. Certification was asked for an $11,556,000 plant for producing substances for rubber-base paints and reinforced plastics. Certification was also given for a $2,397,650 polystyrene resin plant.

* * * * * * * * * *

A southwestern sand and gravel company truck, loaded with 5 cu. yd. of ready-mixed concrete, recently broke in half while enroute on a delivery job. Weight of the truck and load was estimated at 40,000 lb.

* * * * * * * * * *

A large cement plant in North Korea was a recent target of United Nations warplanes. Jet and propeller-driven fighter bombers and B-26 light bombers strategically scattered a few bombs which reportedly destroyed considerable of the buildings. The plant supplied cement for the enemy's military installations.

* * * * * * * * * *

The constitutionality of the Ohio Turnpike Act was recently upheld by the Supreme Court when it refused to review an Ohio court decision against three Ohio taxpayers who had brought suit against the Turnpike Commission. The plaintiffs contended the superhighway would depreciate the value of their property. When the state court ruled the turnpike had been properly authorized by the state legislature, the plaintiffs appealed their case to the Supreme Court, declaring they had been deprived of property values without due process of law, but the high court declined to listen to the case.

* * * * * * * * * *

Transportation and the storage industry had received the largest volume of fast amortization allowances under the mobilization program up to September 5, according to a Defense Production Administration report. Railroads, truckers and warehouse operators reportedly obtained certificates of necessity for $3,777,323,000 of new or expanded facilities since late 1950. The iron and steel industry, with necessity certificates covering projects valued at $3,771,131,000, is running a close second.

THE EDITORS



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# Specifications can be the means of enduring prosperity to an industry

ONE OF THE BEST discussions we have heard on the subject of specifications was given before a southeastern meeting of the concrete masonry industry by D. L. Chaney of the Portland Cement Association. His presentation covered problems in meeting government specifications, with particular emphasis on the relatively new requirement of the Corps of Engineers that concrete masonry units be delivered with a moisture content not to exceed thirty percent of the maximum absorption capacity of the units.

What we liked about Mr. Chaney's talk was that he interpreted the specification as being a challenge which the industry should accept as representing progress, and use as a stepping stone to a more guaranteed future prosperity.

Usually, the majority of producers in the rock products and concrete products industries take an attitude of resistance, or they at least complain bitterly, whenever specifications are enacted that impose new and difficult operating problems.

Certainly, there has been good reason to oppose some of the many unrealistic specifications written by imaginative perfectionists, which these industries have had thrust at them in recent years. Some of the requirements, as they involve aggregates, portland cement and concrete, might be tolerated but for the manner of their interpretation and policing by overzealous and impractical inspectors.

### Performance Specifications

Not all specifications are bad or impractical, on the other hand, and if compliance with such requirements actually will result in better performance of the product, it is to the interest of the producer to take steps to meet them. There is little to gain, and perhaps much to lose, in attempts to compromise on provisions when a specification's soundness is backed up with facts.

Back of this thirty percent moisture provision of the Corps of Engineers, discussed by Mr. Chaney, there is substantial proof that it represents a forward step to reducing volume change in concrete masonry walls. When used to lay up large walls in particular, units dried to meet the new requirement have shown far less tendency to cause cracking from shrinkage when compared to similar walls built of higher moisture block.

The greatest amount of shrinkage occurs when moisture below the forty percent, still permissible by A.S.T.M. standards, starts to be removed from a masonry wall. The draw-off of moisture as a wall approaches equilibrium with the humidity of the surrounding atmosphere apparently is water from the inner pores which then tend to close up with resultant volume change.

Whatever the scientific explanation, it is plain that the lower the water content in a wall when laid, the less the potential shrinkage that remains to come later. It follows that the extent and size of cracking from shrinkage will be proportionately reduced as this shrinkage factor is lowered.

### Opportunities to Advance

If favorable performance with drier units continues to be reported, the concrete masonry industry has, indeed, a wonderful opportunity to become more strongly entrenched than ever as the supplier of a superior building material.

This specification is a timely development, too, coming at a time when producers of competitive building materials are putting on a drive to recapture markets that had been lost to concrete masonry. Clay products, reportedly, are making a comeback and causing much concern in some areas, which can only be arrested through manufacturing products of higher quality.

There need be no recovery of markets once lost by them to the concrete masonry industry, by competitive industries, if individual block producers will not permit prosperity to cause them to let down the bars on quality. Even the smallest producer, while he may think he cannot afford accelerated drying and all else that goes with meeting a thirty percent moisture content specification, should exercise restraint and not permit delivery of improperly cured units to any job. A desire to make a fast dollar could mean the loss of his entire business in the future and, with it, tear down the reputation of the entire industry.

It may be necessary to make two classes of units, based on use, if a producer shoots for the drier unit market but it is important that qualified producers meet the test and they should be entitled to a small premium in price to cover added cost. It is just as important for the welfare of the industry that the small operator do what he can to approach, in quality, the product of his larger competitor. This industry's very future depends on best attainable quality.

Bror Nordberg

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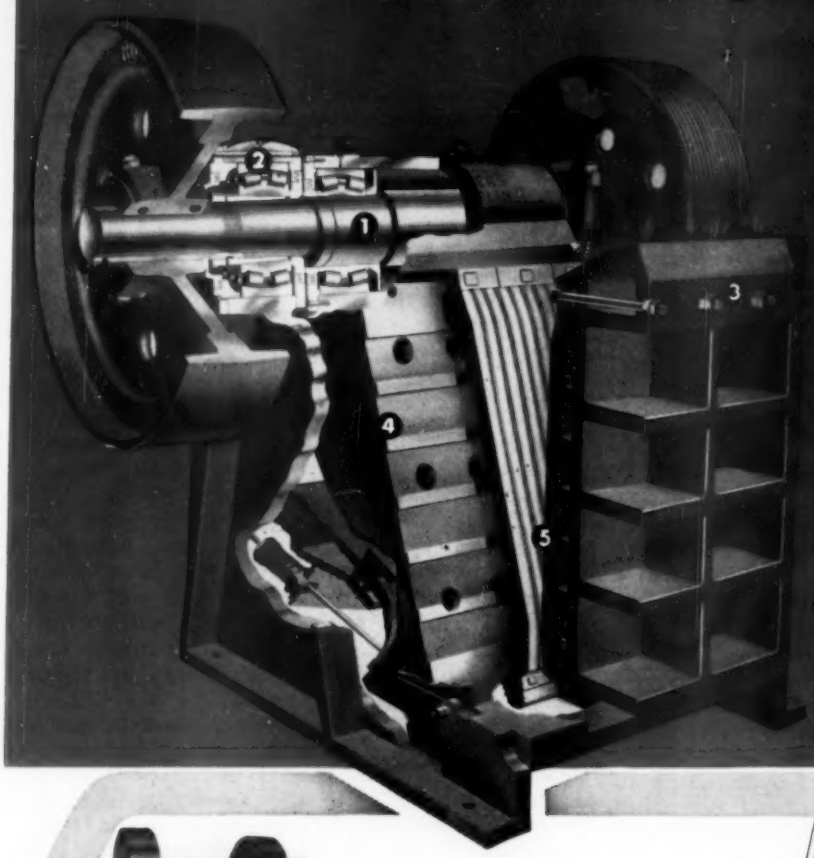
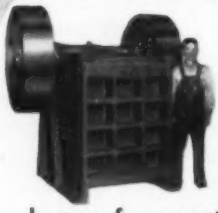
# Here's why YOU CAN RELY ON ROGERS




1. Extra heavy shaft, forged heat treated alloy steel, eccentric and pitman, balanced to activate the pitman in a forward and downward stroke, crushing and forcing material through the crusher.
2. Double row, self-aligning, spherical roller bearings are positive and closely spaced to prevent any possibility of eccentric shaft deflection. Easily adjustable and removable without special tools.
3. Extra heavy, electric welded steel frame. Side plates machined to receive recessed horizontal members before welding. Heavy gusseted ribs welded in place to reinforce frame at points of maximum stress.
4. Heavy box section pitman is made of electric furnace cast steel. The casting is double annealed to avoid any possibility of internal casting stresses. Bearing fits are machined in one operation. Replaceable jaw toe prevents wear on the lower retaining lip of the pitman casting.
5. Jaw plates and cheek plates of high quality austenitic manganese steel. Jaw plates are reversible, plain or corrugated; furnished with straight face, curved non-choking face, or modified non-choking face. Wedged in place, easily replaceable.



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- Jaw Crushers

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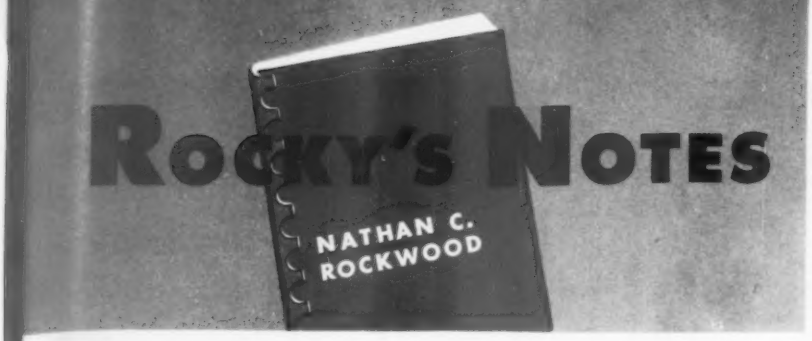


# Chemistry of the soluble silicates

VARIOUS IDEAS regarding the possible chemistry of hydraulic cements, which we have endeavored to explain from time to time, were derived from a book written, or rather published, in 1928 by Dr. James G. Vail entitled "Soluble Silicates in Industry." This book, revised and enlarged, was republished in August 1952, shortly after the death of Dr. Vail. There are two volumes in the new edition.* The first volume is the one referred to here. In the interim, between 1928 and 1952, a great deal of new knowledge on the subject has come to light, and we find the new work of even greater interest to those who would learn more about modern inorganic chemistry of the silicates. Although there are merely a few references to hydraulic cements in this book, a reader with imagination can draw many inferences and possibly parallels in the chemistry of the soluble silicates of the alkali metals and the insoluble silicates of the alkaline earths such as those presumably to be found in hydraulic cements.

The similarity between sodium silicate and calcium silicate begins with similar methods of manufacture. Most modern commercial sodium silicate is manufactured by fusing mixtures of sand (silica) with sodium carbonate in furnaces. The major ingredient in modern portland cement is manufactured by at least partly fusing silica in some form with calcium carbonate in a furnace. Since sodium oxide ($Na_2O$) derived from sodium carbonate ($Na_2CO_3$) is readily fusible and calcium oxide (CaO) derived from calcium carbonate ($CaCO_3$) is practically infusible at possible furnace temperatures, it is much easier to make sodium silicate "glass" than calcium silicate glass, or crystals. Likewise silica is much more readily dissolved in a soluble (in water) alkali hydroxide than in a hydroxide like hydrated lime which is only slightly soluble in water. Yet there is every reason to believe that the same kind of reactions take place in both instances, the difference being only the degree in solubilities and in the valencies of sodium and calcium. One atom of calcium with a valence of two is equivalent to two sodium atoms with a valence of one each. They are near the same ionic diameter and hence can usually replace one another in any silicate structure or lattice that is sufficiently open.

In the form of solutions the sodium silicates are apparently in true chemical (ionic) solution up to a certain molecular proportion of silica to sodium oxide; then they become at least partly colloidal, which means that the single, dispersed ions of silica or silicate start to join up into aggregates of colloidal size. Apparently the same thing happens in the case of the calcium silicates except that such chemical or ionic solutions as exist are in extremely dilute solution. Thus aggregation or the formation of silica or silicate particles of colloidal size must begin much earlier in the dehydration of calcium solutions. It is the theory, of course, that all the calcium silicate formed in hydraulic cements first passes through a true solution stage, but it has always seemed to us much more plausible that the major part of the reaction takes place between hydrated lime of colloidal size and hydrated silica of colloidal size, and that the major product of the reaction is more of colloidal mixture of the two than a real chemical combination, especially in so far as it concerns the lime in excess of that required for the mineral $CaSiO_3$ (wollastonite) or $CaO{\cdot}SiO_2$.

### The Right Start

With one statement of Dr. Vail's in chapter 4 on "The Heterogeneous Systems," we heartily agree since we have been harping on the same subject these several years. He begins the chapter as follows: "The behavior of silica in Nature presents a vast range of phenomena significant to industry. The processes of rock formation, the differentiation and concentration of minerals, and the eruption of volcanos are the unit processes of chemical industry on a grand scale. . . . . Many of these changes [in Nature] have taken place at temperatures and pressures not available in the laboratory, but much is being learned about their mechanism. The study of silicates in the arts may well begin with the consideration of silicates in Nature."

The scientific study of portland cement did, of course, begin with a study of the silicates in Nature, but since those early days with the ever constant trend toward specialization in all branches of science, it has often seemed that the study of cement and concrete has overlooked many developments of geochemical science in related fields. To one who was thoroughly familiar with the chemistry of the soluble silicates there never need to have been any mystery in the "cement-alkali-aggregate reaction." Since under normal, or shall we say natural, conditions calcium would replace sodium in a changing silicate structure, it would seem entirely possible to use this principle to "calcify" or make concrete with a tendency to integrate instead of one to disintegrate. The beneficial effects of calcium chloride in concrete may be in some way tied in with this kind of a reaction. In calcium chloride the calcium is in solution (in dispersed ions) while in the case of calcium hydroxide very little is ever in solution. Also, of course, there is a significant difference in pH values.

Our author quotes J. F. Hazel as follows: "The conclusions of Harman concerning the constitution of [sodium] silicates of different ratios [$Na_2O$ to $SiO_2$] are consistent, in general, with that portion of the results of the present work which bears on the subject. In concentrated solutions at high alkalinities, the silica in the silicates of ratio 1:1 and 1:2 exists predominantly as small hydrated particles approaching, or of, ionic size. On the other hand, the silica in concentrated solutions of the silicates of ratios 1:3.30 and 1:3.98 are polydisperse with respect to size. In the latter case, it is present as aggregates which range in size from ionic to colloidal dimensions. Increase in the silica ratio increases the size and number of these aggregates. The ability of the aggregates to function as nuclei for condensation increases with size."

If we assume that one calcium ion is able to serve the same purpose as two sodium ions, the 1:1 sodium silicate would correspond to a 1:2 calcium silicate, in which the particles of lime and silica would be of ionic size and the combination would be stable and truly chemical. However, when the molecular proportion of lime is increased we have some of the silica ($SiO_2$) ions dispersed in a medium of calcium hydroxide [$Ca(OH)_2$], which is readily removed by continued leaching with water. If more reactive silica were present it would slowly take on some of this excess $Ca(OH)_2$. The most reactive form of silica we could have would be in the form of sodium silicate, but, judging by the paragraph just quoted, silica particles of colloidal size or larger also must be present to supply the necessary nuclei for the condensation, or grouping of this silica or some kind of calcium silicate, as

(Continued on page 132)

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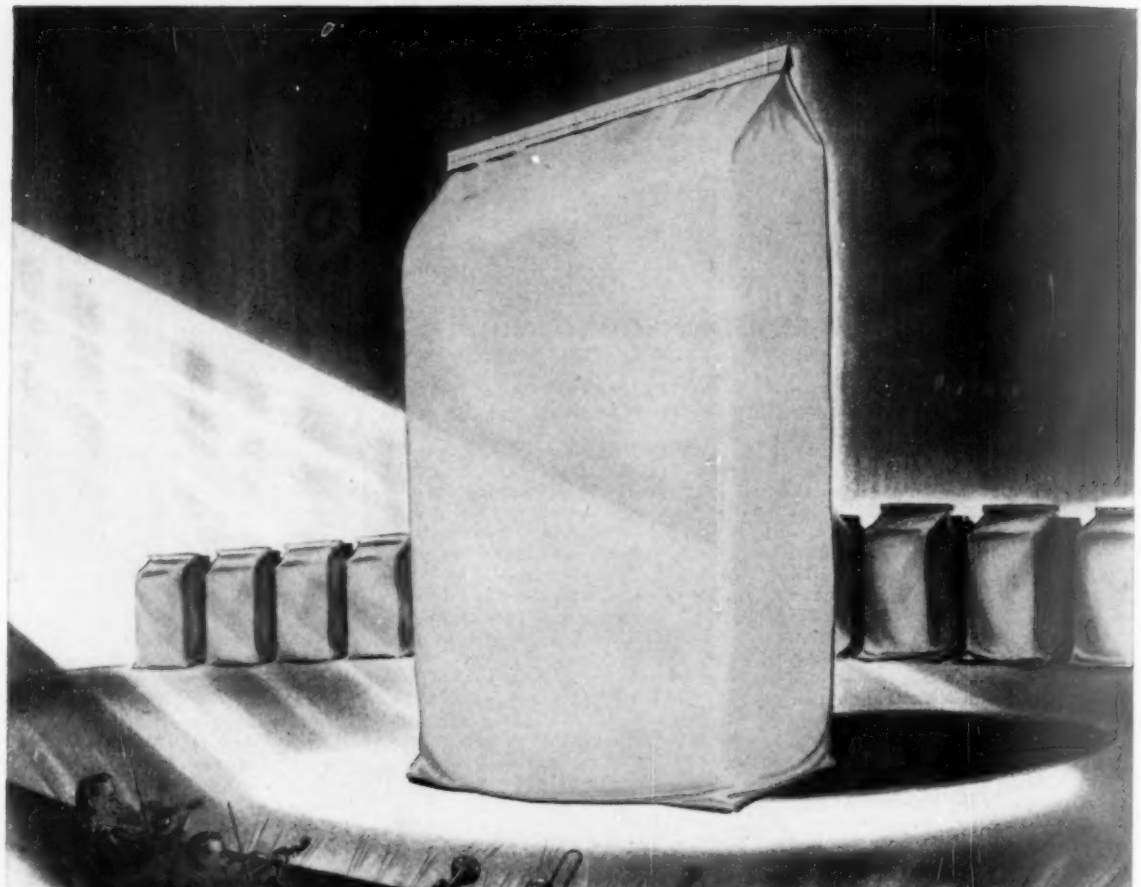

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# L R T

THE LABOR RELATIONS ISSUES in the recent political campaign were not too closely drawn. Candidate Stevenson, after apparent hesitation, felt compelled to accept President Truman's clamor for repeal of the Taft-Hartley Act, since he could hardly repudiate his actual "campaign manager." Consequently, a large majority of voters repudiated both Truman and "his man Friday." General Eisenhower, in an apparent effort to placate union labor bosses and possibly win labor votes, which experience shows labor bosses can not deliver, came out for "revision" of the Taft-Hartley Act to prevent its use for "union busting."

The man who knows most about the law and the experiences of both labor and industry under it is Robert A. Taft. Presumably, he will be an important factor in posting the new President on any needed changes in the law. Since General Eisenhower is keen witted and fair minded, it seems certain that the law will be improved for the benefit of the public, labor and industry alike. The election proved that the rank and file of labor is not hostile to the law in spite of the greatest efforts possible of the labor bosses to convince them that the law is a "slave labor" law. Possibly this campaign by the labor bosses served a useful purpose by inducing more of the rank and file of labor to become more familiar with the law. No one can do that and have any doubt that one of its primary purposes is to protect the worker from slavery to union bosses.

## Union Objections to Law

The C.I.O. objections to the Taft-Hartley Act have been unreasoning from the beginning. The underlying motive, of course, was to cash in on the inside track to the White House held by the head of the C.I.O. throughout the Roosevelt and Truman administrations. Its influence there was so great that it is reputed to have named the Secretary of Labor in Truman's cabinet, various members of the National Labor Relations Board, and numerous other lesser federal officers. The obvious favoritism shown the C.I.O. was undoubtedly the deciding factor in the eventual decision of the A.F. of L. to take sides in the recent campaign, so that it too might claim a place on the Stevenson band wagon. It made preparation for a Stevenson victory by setting up a committee to draw up a detailed "indictment" against the Taft-Hartley Act.

The resolution creating the committee reads, in part, as follows:

"Concrete evidence is provided by the executive council of the way in which recent actions by the courts and the National Labor Relations Board have abridged the rights of workers, imposed ruinous financial burdens upon unions, and invaded the workers' freedom of association and the right of collective bargaining.

"Repeal of the Taft-Hartley Act is a clear and urgent necessity, not only for the preservation of the rights of labor, but also for the maintenance of sound labor-management relations and of industrial peace. Board proceedings and court decisions which today are a burden and a threat to organized labor may tomorrow become the source of the destruction of the labor movement itself if unemployment should become widespread with workers competing for jobs.

"Before the 83rd Congress convenes, labor must have ready factual evidence bringing out specifically the injustices, inequities, and danger of the Taft-Hartley Act. This should become the basis for our legislative program in the next Congress whereby the obnoxious, dangerous, and unjust provisions of the Labor-Management Relations Act of 1947 could be removed and proposals for sound and equitable enactments could be placed before Congress.

"We realize divergent views are entertained by some of our affiliates as to how best to meet the emergencies and exigencies experienced under the Taft-Hartley law and of future difficulties to be experienced. Then, too, differences exist regarding provisions that should replace those of this restrictive law. All are in agreement that unity of approach as well as in spirit are essential to success."

It is obvious that the A.F. of L. union bosses' objections to the law are based primarily on the recent more fair decisions of the N.L.R.B. and the courts. With experience and the lessening of communist influence in the N.L.R.B. and the better understanding of the objects of the law by the courts, the labor unions are being made aware of their own responsibilities to the public welfare. This is hard to accept since they have so long had their own way with an obviously prolabor government. It is further proof of the wisdom of the nation's founders in making the justices of our federal courts independent of the executive who appoints them. Very few men once given the title of "justice" or "judge" become so partisan as to be conspicuous as partisans.

## Taft on Taft-Hartley Law

It is obvious that no radical changes will be made in the Taft-Hartley Act without the approval of Senator Taft, who will head the Labor Committee of the Senate and undoubtedly will be the most important policy maker of the 83rd Congress. In the welter of campaign oratory, perhaps many of our readers missed Senator Taft's speech at Benton Harbor, Mich., September 24, in which he expained, as no one else could, some of the philosophy of the law which he was so instrumental in having enacted, and which subsequent Congresses consistently refused to repeal in spite of all the pressure the President could bring to bear. In part, Senator Taft said:

"The Taft-Hartley law provided for fair labor practices on the part of unions as well as employers, and thus put the government in the position of being an arbiter holding the scales of justice evenly between the contesting parties, to see that bargaining is in fact fair and free. Under the Wagner Act the N.L.R.B. was forced to intervene in almost every strike as a partisan of labor, and in fact came to regard itself as the agent of a crusade to put a union, and a C.I.O. union at that, into every industrial plant in the United States. No one has ever denounced the Wagner Act and the N.L.R.B. as bitterly as did Mr. William Green (president of the A.F. of L.) himself in testifying before the Senate Labor Committee in 1939.

"There is something to be said for leaving this whole field completely free of statutory control, the position of John L. Lewis.

"This would have meant the repeal of the Wagner Act, however, and I was not in favor of such repeal because it did seem to me that, without some government power, powerful unions would have a tremendous advantage over small employers, and powerful employers woud have a tremendous advantage over their employes.

"Mr. Stevenson criticizes some of the unfair labor practices prohibited in the case of unions. He indicates quite clearly that he would restore the closed shop in the maritime industry, the building trades, and the printing trades at least. It is hard to see how he could do it in these cases without doing it in all industry. He doesn't dare use the word 'closed shop' because he knows that the American people are opposed to the closed shop and that he would be completely discredited if they knew that he was advocating its return.

(Continued on page 131)

# HOW EAGLE'S "FOLLOW THROUGH" ENGINEERING HELPS AGGREGATE PRODUCERS

• Just call us "Doctor Eagle"... we diagnose your washing and classifying problems . . . and prescribe the remedy . . . recommendations based on nearly a half century of experience and thousands of successful plants to our credit. With a sack of your material in our "lab" and information concerning your deposit, plant and objectives from you . . . or relayed through our distributor . . . we can run tests to determine your needs.

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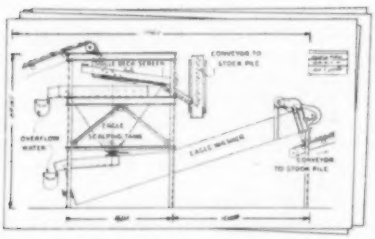

• Once you have used Eagle Fine Material Washers, Classifying and Dehydrating units, Eagle Coarse Material Washers or Eagle Log Washers, you will learn their many advantages, benefitting increasingly as you become familiar with their operation.

## Eagle's "Follow Through" Engineering Helped This Kansas Producer

• Consumers Sand Co., Topeka, Kansas, was flooded out in the 1951 Kansas flood. Undaunted, they rebuilt their plant . . . better than ever, because the new plant, a pumping operation, includes an Eagle 16' Water Scalping Tank with split collecting flume and an Eagle Fine Material Washer — Classifier — Dehydrator.

• The area Eagle distributor got the facts and Eagle engineers made their recommendations. Equipment was installed with the help of "follow through" engineering, including layout prints. Result: a highly efficient, profitable plant.

• A coarse gradation of sand is scalped from the tank, which also removes excess water. A fine gradation is produced by the Eagle screw unit.

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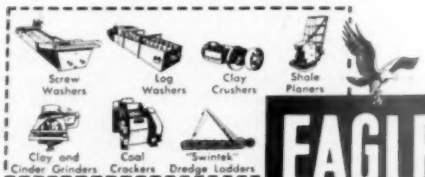


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# PEOPLE in the news

## Consultant Retires

PROF. WILLEM RUDOLFS, consultant and author of many reports to the National Lime Association on the treatment of sewage and trade wastes, is retiring January 1, 1953, after 33 years of teaching, research and consulting work in sanitary engineering at Rutgers University. He will return to his native Holland with Mrs. Rudolfs. Born in Wangeningen, The Netherlands, Prof. Rudolfs studied at the government university there; Pasteur Institute in Paris, and the University of Illinois. In 1919 he went to Rutgers University as a research fellow. Two years later he won his Ph.D. as a biochemist in entomology and took over water and sewage research of the State Agricultural Experiment Station at Rutgers in New Brunswick, N.J.

## Congressman Stauffer!

CONGRATULATIONS to S. Walter Stauffer on his election as Congressman from his home district of York, Penn. Mr. Stauffer, who was president and general manager of the National Lime Association from 1936 to 1946, defeated his Democratic opponent in the recent Republican landslide. We wish him the best of luck!

S. Walter Stauffer

## A.S.T.M. Secretary

ROBERT J. PAINTER has been appointed executive secretary of the American Society for Testing Materials, Philadelphia, Penn., to succeed the late C. L. Warwick, who died suddenly on April 23. Raymond E. Hess has been named associate executive secretary and editor in chief. Mr. Painter was formerly treasurer and assistant secretary. A native of New York State, he received his degree in civil engineering from Rensselaer Polytechnic Institute in 1928. Prior to joining the A.S.T.M. staff in 1931, he served in the special engineer's office of the Bethlehem Steel Co. Mr. Hess was formerly assistant executive secretary and editor. He is a native of Philadelphia and a civil engineering graduate of the University of Pennsylvania. He has been a member of the A.S.T.M. staff since 1920.

## Heads Design Department

AUGUST R. KREHBIEL has been appointed head of the design department of The Carter-Waters Corp., Kansas City, Mo., where he will be available to assist architects, engineers and contractors in the use of concrete block and precast concrete. Mr. Krehbiel received his A. B. degree from the University of Kansas in 1909 and his master's degree in 1910. He started his career in the concrete industry in Wichita, Kan., in 1924, and was manager of the Trusswall Stone Co., Kansas City, from 1929 to 1947. He has been associated with Carter-Waters since 1949.

## General Sales Manager

COLIN L. CAMPBELL, formerly southern California district sales manager, has been appointed general sales manager of Kaiser Gypsum Co., with headquarters in Oakland, Calif. Sidney Smith has been named general merchandise manager. He was formerly northern California district sales manager and will be succeeded in this position by Richard Northon, product sales manager. James Hague, also a product sales manager, succeeds Mr. Campbell as southern California district sales manager.

## Heads Potash Production

RUSSELL C. HAWORTH has been appointed vice-president in charge of production of the Potash Company of America, Carlsbad, N.M., in addition to his duties as resident manager. Directors and officers who were re-elected at the recent reorganization meeting are C. K. Boettcher, chairman of the executive committee; Arthur G. Rydstrom, vice-chairman; C. F. Coope, president; F. O. Davis, vice-president and treasurer; Homer H. Harris, vice-president and secretary; George E. Pettit, vice-president in charge of sales; G. R. Harris, Eugene H. Adams, Charles Boettcher II, Mason A. Lewis, Albert K. Mitchell and H. C. Van Schaack.

## District Engineer

JACK Y. BARNES, formerly field engineer with the Des Moines, Iowa, office of the Portland Cement Association, Chicago, Ill., has been appointed district engineer of the new district office in Helena, Mont. Mr. Barnes joined P.C.A. in 1937 as office engineer with the Des Moines office. Three years later he was appointed field engineer for northwest Iowa, with headquarters in Mason City. A graduate of Iowa State College with a B.S. degree in civil engineering, Mr. Barnes served three years with the U.S. Soil Conservation Service before joining the Portland Cement Association.

Jack Y. Barnes

## Association President

D. E. GREEN, Bear Canyon Mining Co., has been elected president of Arizona Asbestos Producers Association. Barry DeRose, Apache Asbestos Mines, has been named vice-president, and Jack Neal, Metate Asbestos Co., secretary-treasurer.

## Celebrates Golden Wedding

WILLIAM DAVID HUGHES, secretary-treasurer of the Alexander Sand and Gravel Co., Albuquerque, N.M. and Mrs. Hughes recently celebrated their golden wedding anniversary. They were married in Pt. Pleasant, W. Va., and have lived in Albuquerque since 1927. Four generations were present at the celebration: Mr. and Mrs. Hughes; their son Charles; their grandson, C. Bill, and their great grandson, Jack Gilbert Hughes, just six weeks old.

## Elected President

HARRY A. CLARK has been elected president of Consumers Co., Chicago, Ill., to succeed Robert C. Reed, who has retired but will continue as a member of the board of directors and

Harry A. Clark

chairman of the executive committee. Mr. Clark was also elected a member of the executive committee. Otto A. Cheska, vice-president in charge of Wisconsin operations, was elected a member of the board of directors and the executive committee.

Mr. Clark has been associated with the company for over 30 years and has served in the capacity of salesman, sales manager and vice-president. Early this year he was elected executive vice-president and a member of the board of directors. Mr. Reed has been a director since 1945 and president since 1950. Mr. Cheska, who has been with the company since 1931, has been vice-president since 1950.

## Executive Vice-President

JOHN D. WILSON, formerly secretary-treasurer of the South Dakota Cement Plant, Rapid City, S.D., has been elected executive vice-president of Giant Portland Cement Co. and its subsidiary, Carolina Giant Cement Co., Philadelphia, Penn. A native of South Dakota, Mr. Wilson attended South Dakota State School of Mines and Technology and graduated from the University of Nebraska, College of Law. Howard S. Ponzer, formerly vice-president in charge of production, has been named vice-president in charge of engineering and development. Frank T. Lamey has been appointed assistant secretary in addition to his duties as controller. He succeeds Alice King Zorn, who has resigned. Robert S. Crawford, treasurer, has also been appointed director of purchases.

## Heads Phosphate Firm

HANS STAUFFER has been elected president of Western Phosphates, Inc., Salt Lake City, Utah, a new company formed by Kennecott Copper Corp., American Smelting and Refining Co. and Stauffer Chemical Co. John Paul Jones has been appointed vice-president and general manager, and F. W. Wieder and M. L. Spealman have been named vice-presidents.

## P.C.A. Chairman

R. A. HUMMEL, chairman of Lone Star Cement Corp., New York, N.Y., has been elected chairman of the board of directors of the Portland Cement Association, Chicago. He succeeds Smith W. Storey, president of General Portland Cement Co. and Consolidated Cement Corp., Chicago, who has served as chairman for the past two years. Mr. Hummel has been a director of the association since 1941. He also served six times on the executive committee.

The following new directors have been elected: R. D. Raff, president, Diamond Portland Cement Co., Middle Branch, Ohio; Ellery Sedgwick, Jr., president, Medusa Portland Cement Co., Cleveland, Ohio; Charles E. Shearer, president, Keystone Portland Cement Co., Philadelphia; and George E. Warren, president, Southwestern Portland Cement Co., Los Angeles.

R. A. Hummel

The retiring directors are: E. E. Duque, president, California Portland Cement Co., Los Angeles; H. E. Harding, chairman of the board, Glens Falls Portland Cement Co., Glens Falls, N.Y.; and R. A. Wetzler, president, Whitehall Cement Manufacturing Co., Philadelphia. Mr. Sedgwick was elected to serve the remaining two years of the term of Harry L. Berno, late president and general manager, Medusa Portland Cement Co., Cleveland, who died last November.

## Elected Director

HARRIS N. SNYDER, vice-president, treasurer and general manager of Buffalo Slag Co., Inc., and president and director of Federal Portland Cement Co. and Federal Crushed Stone Corp., Buffalo, N.Y., has been elected a director of the Manufacturers and Traders Trust Co. of Buffalo.

## Personnel Director

WILLIAM K. SPENCE has been appointed personnel director of Pabco Products, Inc., San Francisco, Calif. He was formerly regional sales manager of the building products division of Reynolds Metal Co. Previously he was sales personnel manager of United States Gypsum Co., Chicago, Ill. Joseph J. Kelley, who for the last 35 years has been associated with U.S. Gypsum Co., has been named assistant to W.. L. Keady, president of Pabco Products, Inc.

## Association President

W. P. MORRIS, manager of Duval Sulphur and Potash Co., Carlsbad, N.M., has been elected president of the New Mexico Mining Association. He succeeds John A. Wood of Chapman & Wood, mining engineers, Albuquerque, N.M.

## Ernest Hallett Donates Church

ERNEST W. HALLETT, president of Hallett Construction Co. and the Becker County Sand and Gravel Co., Crosby, Minn., and Mrs. Hallett have done something probably unique in Minnesota history. They have donated a $200,000 church to the Presbyterian congregation in Crosby. The church was dedicated August 31. Mr. Hallett, who is the only survivor of the 15 organizers of the 41-year-old congregation, was born in Otter Tail county some 70 years ago. He began his career by working in his father's sawmill near Pequot Lakes, Minn., later branching out into construction work. He went to Crosby in 1911, where he founded the Crosby Hardware and Furniture Co., which he still owns, and continued his construction work under the Hallett Construction Co. Among Mr. Hallet's many interests are the Becker County Sand and Gravel Co., which is furnishing 1,000,000 tons of aggregate for the hydrogen bomb plant in Georgia from washing plants in South Carolina; United Construction Co., which is building the substructure of the power house for Garrison Dam; Central States Construction Co.; New London Material and Construction Co.; Jesse H. Mining Co., which is named for Mrs. Hallett; Hallett Coal Co.; and the Brunswick Silica Co. near Cleveland, Ohio. He is also president of the First National Bank of Crosby.



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## Named Assistant

GEORGE QUIST has been appointed assistant to Claude E. Harper, vice-president and general manager of Kaiser Gypsum Co., Oakland, Calif. He was formerly assistant manager of Gypsum Carrier, Inc., a subsidiary.

## P.C.A. Appointment

JAMES A. FOSTER, senior engineer of the Highways and Municipal Bureau of the Portland Cement Association, Chicago, Ill., has been appointed assistant manager of the bureau, which is headed by L. M. Arms. Mr. Arms was appointed manager last July. A graduate of Princeton University, Mr. Foster received his civil engineering degree in 1918. He joined the association in 1936 as a member of the Highways and Municipal Bureau. He formerly served with the Illinois Division of Highways and with a firm of consulting engineers.

## Named Vice-President

A. M. ESBERG has been appointed vice-president of American Potash and Chemical Corp., Los Angeles, Calif., and D. S. Dinsmoor has been elected a director of the company.

## On C. of C. Committee

RALPH L. DICKEY, president of The Kelley Island Lime and Transport Co., Cleveland, Ohio, has been appointed a member of the Natural Resources Committee of the U.S. Chamber of Commerce for 1952-1953. It has been some time since a lime producer has been a member of this committee which develops the policy of the U.S. Chamber of Commerce on all national matters pertaining to natural resources, including percentage depletion.

## Conference Speaker

DR. HARRY W. TITUS, technical counselor and director of nutritional research at the Lime Crest research laboratory of the Limestone Products Corp. of America, Newton, N.J., was one of the speakers at the recent New England Feedman's Conference at the University of New Hampshire, Durham, N.H. The conference included speakers and discussions on poultry, dairy and livestock subjects. Dr. Titus' talk was on poultry.

## Heads Concrete Group

EDWIN B. BARTLETT, JR., Best Block Co., Milwaukee, Wis., has been elected president of the Concrete Masonry Industries of Milwaukee. Bruno Garni, Advance Cast Stone Co. was named vice-president, and Otto Ladwig, Jr., Otto Ladwig & Sons, Inc., was elected secretary-treasurer. The association approved a resolution to change the height of concrete block, effective December 1, reducing the height from 8 in. to the modular system standard of approximately 7⅝ in.

## OBITUARIES

C. DANA WARD, vice-president of Cumberland Quarries, Inc., Indianapolis, Ind., passed away October 7 at his home in Indianapolis. Mr. Ward had been vice-president of the company since its organization in 1941, and had been active in the crushed stone business in Ohio and Indiana since 1912. He was one of the founders and a former president of the Highway Materials and Equipment Association.

JESS L. WORKMAN of the J. L. Workman Quarry, Floyd, Iowa, died October 11 as the result of an accident at his quarry. Mr. Workman, who had operated a limestone quarry near Floyd since 1937, was shoveling underneath a lime bin when a quarry truck backed under the bin, crushing him between the truck and an upright timber support. Mrs. Workman rushed him to the hospital in Charles City where he passed away shortly after arrival. Mr. Workman was an active member of the Iowa Agricultural Limestone Association, having served on several committees, and he regularly attended the annual conventions of the association.

ROBERT M. CORTRIGHT, former superintendent of Allentown Portland Cement Co., Allentown, Penn., died October 20 after an illness of several weeks. He had served the company for many years. He was sales representative at the time of his retirement in 1950 but prior to that was superintendent of the Allentown plant. Before joining the company Mr. Cortright was plant superintendent of Bonneville Cement Co., Evansville, Penn. Previously he served as chemist with several of the Lehigh Valley cement companies. Mr. Cortright, who was a native of Bethlehem, Penn., but a resident of Northampton for the last 34 years, received his degree in chemical engineering from Lehigh University and soon thereafter started his career in the cement industry.

LEE ROY STOLBERG, traffic manager for New England Lime Co., Adams, Mass., died on October 22 in an accident on Route 20 opposite his home in Pittsfield, Mass. He had crossed the highway to mail a letter and was struck by a truck as he returned to his home.

LAWRENCE C. BONNELL, former superintendent of Commonwealth Quarry Co., which is now the Summit plant of North Jersey Quarry Co., Summit, N.J., died November 5 after a long illness. He was 83 years old. Mr. Bonnell became superintendent of Commonwealth Quarry Co. in 1906. He was a member of the board of directors and a technical adviser to the sales department at the time of his retirement in 1944.

CLARENCE F. FEHNEL, retired assistant general purchasing agent of the Penn-Dixie Cement Co., Nazareth, Penn., died October 7 at the age of 67. He had retired in 1946 after an association of more than 40 years with the cement industry. He was secretary and purchasing agent of the Dexter Portland Cement Co. from 1912 to 1926 when the company merged with Penn-Dixie.

NICHOLAS D. CONNELLY, founder of the N. D. Connelly slag processing plant, Chicago, Ill., died recently at the age of 67, following an illness of five months. Mr. Connelly, who founded the company 27 years ago, had been in semi-retirement for several years.

CHARLES W. STIMSON, a member of the board of directors of Superior Portland Cement, Inc., Seattle, Wash., died October 2 at his home in The Highlands. Mr. Stimson, who had been ill since last fall, was 73 years of age.

HENRY C. MATTHIAS, who in 1909, in partnership with Gustav Kretzschmar, founded the Kretzschmar & Matthias Cement Block Co. in Waterloo, Iowa, died October 20. He was 83 years old. The partnership was dissolved in 1919 and Mr. Matthias became a partner with his son in H. C. Matthias & Son, which was later changed to the Waterloo Dredging Co. He was active in the business until his retirement in 1945.

HENRY JAEGER, founder and president of the Jaeger Sand and Gravel Co., Inc., West Allis, Wis., and a pioneer in the sand and gravel industry for over 30 years, died October 17 after an illness of about a week. He was 61 years old. Born in Hungary, Mr. Jaeger moved to Milwaukee when he was 16. He founded the sand and gravel company in the early 1920's. For the past 15 years he was president of the Materials Cooperative Association of Milwaukee county. He was also a member of the National Sand and Gravel Association, Washington, D.C., and a member and past-president of the Wisconsin Dump Truck Owners Association, and affiliated with road and highway improvement organizations.

CHARLES O'LEARY, assistant secretary and assistant treasurer at the Bath, Penn., plant of Penn-Dixie Cement Corp., Easton, Penn., died October 29 at his home in Nazareth, Penn. He was 59 years old. Mr. O'Leary had been associated with the company since 1918, when he joined the Portland Point, N.Y., plant. In 1927 he was transferred to the Bath plant where he had remained ever since. He was a native of Cortland, N.Y.

W. J. D. REED-LEWIS, engineer for the Dragon Cement Co., Inc., New York, N.Y., died November 3.

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# industry news

Over 400,000 cu. yd. of clay and shale are being removed by 5 International TD-24's (equipped with scrapers) at Santa Cruz Portland Cement Co.'s new limestone quarry near Davenport, Calif.

## Materials Exempted From Renegotiation

THE RENEGOTIATION BOARD has amended the Renegotiation Act of 1951 to include a list of the industries now exempted from renegotiation, under the exemption for raw materials. The following materials are included: aggregates, including washed or screened sand, gravel or crushed stone; asbestos rock; asbestos fiber; barytes, crude crushed; bentonite, dried, crushed, granulated and pulverized; cement, natural and portland; diatomaceous silica, lump, block, brick and powder; dolomite, crushed dolomite; feldspar, crude and ground; fluorspar ore; fluorspar fluxing gravel; lump ceramic ground fluorspar; acid grades of fluorspar, fuller's earth; gypsum, crude; calcined gypsum; lime, including quick lime; limestone, crushed limestone; magnesite; dead-burned magnesite; mica, crude, hand-cobbed; block mica; sheet mica; film mica; splittings; wet or dry ground mica; phosphate rock; elemental phosphorus, ferrophosphorus; phosphorus pentoxide and phosphoric acid derived directly by treatment of phosphate rock; superphosphate; pumice, lump; talc, crude, lump, ground and sawed; vermiculite ore, crude, crushed and expanded; and whiting, chalk lump.

## Wins Reporting Award

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., for the eighth consecutive year, won the bronze "Oscar of Industry" trophy for its excellence in annual reporting, in the 12th international competition sponsored by the *Financial World* Annual Report Survey. A total of 5000 reports, representing 100 industrial classifications, were considered for the "Best of Industry" awards. An independent board of judges named Marquette's 1951 annual report the best in the cement industry. Permanente Cement Co., Oakland, Calif., was runner-up for top honors, while Lone Star Cement Corp., New York, N.Y., placed third.

Weston Smith, *Financial World's* executive vice-president and originator of the annual report surveys, presented the "Oscar of Industry" trophies at the annual awards banquet, held in the Grand Ballroom of the Hotel Statler, New York, N.Y., October 28, 1952.

## Vermiculite Research

A VERMICULITE INFORMATION SERVICE CENTER has been established at Chicago, Ill. Developed and operated by Zonolite Co., Chicago, the service center contains data on all known vermiculite research of the past 25 years. Results of tests and experiments, conducted by the firm, universities and many research organizations, are included. Requested data can be located on immediate notice for contractors, architects, engineers and researchers who wish to avail themselves of this free service.

## Conservation Funds

FEDERAL FUNDS under the 1952 Agricultural Conservation Program for payment to farmers for soil conservation practices in Kansas recently were reported to have been exhausted ahead of schedule as the result of increased interest in conservation work, ideal working conditions for carrying out many of the practices and better knowledge of certain new regulations. Approximately 150 applications had to be cancelled because of the rapid depletion of the available fund.

The new regulations provided that 1953 funds could not be used until the Production and Marketing Administration community and county committees are elected and farmers are interviewed about their most needed practice for next year. It will probably be early 1953 before payments can be resumed, it was predicted.

The local P.M.A. office announced that as many of the permanent type improvements in the process of construction or completion as it is possible to support will be completed. The importance of federal agricultural limestone funds is emphasized by that fact that the stoppage caused Riddle Quarries, Inc., to recall all its spreading crews.

## Canadian Asbestos

CASSAIR ASBESTOS CORP., LTD., Edmonton, Alberta, Canada, will operate a 300-acre asbestos deposit in the McDame Lake area of northwest British Columbia, which geologists have declared may be the world's largest.

## Cover Picture

SECONDARY BLASTING in the quarry of Franklin Limestone Co., Nashville, Tenn., has been reduced to a minimum by the use of a drop ball to break large pieces of rock to sizes which can be handled by shovels loading to trucks. This practice has become a rapidly growing trend in quarry operations. In the illustration, a D-8 Caterpillar tractor with a No. 8-S bulldozer and Hyster Hystaway is equipped with a drop ball. A perforated screen plate protects the tractor operator from flying rock fragments.

## Fluorspar Flotation Plant

KAISER ALUMINUM & CHEMICAL CORP., Oakland, Calif., has started production at its fluorspar flotation plant at Fallon, Nev. The plant has a capacity of 100 tons of fluorspar rock daily, which will produce 30 to 50 tons of concentrates. Daily output of concentrate will depend upon the grade of fluorspar mined at the Baxter property about 70 miles southeast of Fallon. The corporation purchased the Baxter mine from H. W. Gould & Co., San Francisco, Calif., for a price reported at about $350,000, and is understood to be interested in other fluorspar deposits in Nevada. Capacity of the plant may be expanded later to process minerals from other company properties.

## Industrial Applications of Atomic Energy

P. J. LOVEWELL, assistant chairman of the department of industrial economics, Stanford Research Institute, Stanford, Calif., as one of ten speakers participating in a comprehensive symposium on industrial applications of atomic energy, staged as part of the seventh National Chemical Exposition by the Chicago, Ill., section of the American Chemical Society, warned businessmen that the utilization of atomic energy by industry is so close that they should be alert against the danger of getting caught with obsolete plants, processes and products. Potential developments in atomic power, according to Mr. Lovewell, are bound eventually to have a major impact on practically every segment of business and industry, with manufacturers and power utilities first affected. He predicted that the introduction of atomic power and processes, sired by the atomic energy program, may begin on a modest scale within the next five years. Of primary importance now, he advised, is for management to keep informed as to developments affecting plans and to maintain research programs to protect their competitive interests.

Present technical developments which are expected to affect business were classified into three types: (1) heat-producing atomic reactors for the production of power; (2) industrial applications of radioactive by-products of fission now stored as wastes, such as high-speed, low-cost industrial radiography, heatless sterilization of food and drugs, portable low-level power sources, improved propagation of flame as in internal combustion engines, the activation of chemical reactions and others; (3) the use of radioisotopes—chemically pure radioactive forms of various elements, made in the atomic pile or separated out of the reactor wastes. These are already being used in instruments such as thickness and liquid level gauges and density meters, for activation of phosphors, for static elimination, and in another form as tracers to permit scientists to trace atoms tagged by radioactivity through various processes, industrial or physiological.

## Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 23,010,000 bbl. of finished cement in September, 1952, as reported to the Bureau of Mines. This was an increase of 3 percent compared with the output in September, 1951. Mill shipments totaled 26,243,000 bbl., an increase of 13 percent over the September, 1951, figure, while stocks were 9 percent below the total for the same months in 1951. Clinker production during September, 1952, amounted to 22,135,000 bbl., an increase of 2 percent compared with the corresponding month of the previous year. The output of finished cement during September, 1952, came from 154 plants located in 37 states and in Puerto Rico. During the same month of 1951, 22,269,000 bbl. were produced in 154 plants.

## Talc Mill

SIERRA TALC & CLAY CO., Los Angeles, Calif., started production at its $500,000 mill at Grand Island, Neb., processing talc from the company's mines near Norris, Mont., as well as from its mines in Nevada and California. The Montana mine is said to contain the largest deposit of high-purity steatite talc ever to be mined.

## Coming Conventions

**December 9-10, 1952—**
**Missouri Limestone Producers Association, 8th Annual Convention, Hotel Governor, Jefferson City, Mo.**

**January 13-16, 1953—**
**Highway Research Board, 32nd Annual Meeting, National Academy of Sciences, Washington, D.C.**

**January 14-15, 1953—**
**Wisconsin Concrete Products Association, 33rd Annual Convention, Plankinton House, Milwaukee, Wis.**

**January 18-21, 1953—**
**National Agricultural Limestone Institute, 2nd Annual Convention, Hotel Statler, Washington, D.C.**

**January 26-29, 1953—**
**National Concrete Masonry Association, 33rd Annual Meeting and Concrete Industries Exposition, Cleveland Public Auditorium, Cleveland, Ohio.**

**February 2-3, 1953—**
**National Concrete Products Association (Canada), 4th Annual Convention, King Edward Hotel, Toronto, Ont., Canada**

**February 2-6, 1953—**
**National Crushed Stone Association, 36th Annual Convention, Hotel New Yorker, N.Y., N.Y.**

**February 9-11, 1953—**
**American Road Builders' Association, Annual Meeting, Hotel Statler, Boston, Mass.**

**February 17-19, 1953—**
**American Concrete Institute, 49th Annual Convention, Hotel Statler, Boston, Mass.**

**February 23-26, 1953—**
**National Sand and Gravel Association, 37th Annual Convention, Fairmont Hotel, San Francisco, Calif.**

**National Ready Mixed Concrete Association, 23rd Annual Convention, Fairmont Hotel, San Francisco, Calif.**

**February 25, 1953—**
**American Concrete Pressure Pipe Association, 4th Annual Convention, Baker Hotel, Dallas, Texas.**

**February 26, 1953—**
**American Concrete Agricultural Pipe Association, 3rd Annual Convention, Baker Hotel, Dallas, Texas.**

**February 26-28, 1953—**
**American Concrete Pipe Association, 45th Annual Convention, Baker Hotel, Dallas, Texas.**

**March 4-5, 1953—**
**Iowa Agricultural Limestone Association, 8th Annual Convention, Savery Hotel, Des Moines, Iowa.**

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## Potash

POTASH DELIVERIES in North America, during the second quarter of 1952, by the six major American potash producers, and also imports, totaled 896,364 tons of potash salts, containing an equivalent of 518,022 tons of $K_2O$, according to figures recently released by the American Potash Institute. This was a new high in potash deliveries and represented an increase of 4 percent in salts and 6 percent in $K_2O$, over the tonnage delivered during the corresponding quarter in 1951.

Deliveries during the quarter for agricultural purposes in the United States, Canada, Cuba, Hawaii and Puerto Rico, amounted to 858,842 tons of salts, equivalent to 494,748 tons of $K_2O$, consisting of 466,823 tons as muriate, 370 tons as manure salts, and 27,555 tons as sulfate of potash and sulfate of potash-magnesia. Deliveries for chemical purposes amounted to 35,041 tons of salts, equivalent to 21,760 tons of $K_2O$.

During the first six months of 1952, total deliveries, including imports, amounted to 1,560,935 tons of salts, equivalent to 898,865 tons of $K_2O$. This was an increase of 5 percent in salts and 6 percent in $K_2O$, compared to the same period of 1951.

## Uranium from Phosphate

PHOSPHATE ROCK deposits in Idaho and Montana, it is said, could supply the nation with uranium. Small quantities of uranium can be recovered in the processing of phosphate. Although a ton of phosphate rock may contain only a few grams of uranium, the yield could be substantial because of the great tonnages of phosphate being processed nationally. Florida rock is being processed in the Blockson Chemical Co. processing plant near Joliet, Ill., but western phosphate also could be used.

Montana activities include production of phosphate at Montana Phosphate Products Co., Garrison, Duke Mines, and George Relya, all of which are exporting to Trail, B.C. Manganese Products Co. is operating in the Philipsburg area. International Minerals and Chemical Corp. is developing the Douglas Mountain mine. Soluble Phosphates Co. is operating the Maxville mine. Anderson Phosphate Mines Co. is developing its Melrose mine. Victor Chemical Works is operating its processing plant near Butte.

The Bureau of Mines reports phosphate mining and processing activities are increasing in Idaho. The Gates Bros. plant will process rock from Montpelier and Paris. Teton Phosphate Co. is also operating at Montpelier. Simplot Fertilizer Co., Pocatello, is running the Cay mine on the Fort Hall Indian reservation. There is also a $4,000,000 Westvaco chemical plant near Pocatello.

H. C. "Pat" Maginn (center) presents gold watches to Marion Heard (second from left), William Schwoerer (second from right), and Raymond L. Cuneo (right); also participating in presentation ceremonies was E. M. Baker (left), plant manager

## Honors 25-Year Employes

CALAVERAS CEMENT CO., San Francisco, Calif., recently honored three of its employes for completing 25 years in the service of the company. A special plant luncheon was held to commemorate the event, at which time gold watches and fobs were presented to the honored guests. "Pat" Maginn, executive vice-president of the company and chairman of the management committee, presented the awards. Those receiving awards were Marion Heard, assistant plant manager; Raymond L. Cuneo, labor foreman; and William H. Schwoerer, oilhouse attendant.

## Fair Labor Standards Act

NATIONAL CRUSHED STONE ASSOCIATION, under Executive Letter No. 12, has issued to its members a report, prepared by its counsel, Gall, Lane and Howe, covering a recent decision by the U.S. Court of Appeals for the Eighth Circuit, relating to the application of the Fair Labor Standards Act to the crushed stone industry.

According to the report, the U.S. Court of Appeals has ruled that "employes engaged in the quarrying of crushed rock and in the production of rock and oil mat aggregates for use in maintaining interstate highways and other concrete structures such as dikes and revetments in rivers, and in keeping records pertaining to such work, are engaged in the production of goods for commerce and so are covered by the wage and hour provisions of the Fair Labor Standards Act." This decision supports the position of the Wage and Hour Division of the Department of Labor.

## Gypsum Research Building

CERTAIN-TEED PRODUCTS CORP., Ardmore, Penn., has completed a $400,000 building in Paoli, Penn., where all product development and testing and plant engineering will be centered.

## Asbestos Price Increase

THE OFFICE OF PRICE STABILIZATION, under SR-36 to CPR-22, granted a 5½ percent increase to the ceiling prices of asbestos-cement siding and clapboards, roofing shingles, flat sheets, corrugated sheets and asbestos-cement accessories used in connection with these products. The increase was allowed under the O.P.S. "earning standard" which reflects the increased cost of metals and outbound transportation. However, manufacturers may not use both the 5½ percent price adjustment and the adjustments for higher outbound transportation rates recently allowed by O.P.S.

## Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of October and for the first ten months of 1952 are listed by the Portland Cement Association as follows:

| | Sq. yd. awarded | |
|---|---|---|
| | During October 1952 | During first ten months 1952 |
| Roads | 1,486,291 | 23,051,430 |
| Streets and alleys | 2,259,377 | 23,368,279 |
| Airports | 1,512,351 | 8,800,351 |
| Totals | 5,258,019 | 55,220,060 |

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# H H

## Material Handling

KNOX CONCRETE PRODUCTS, INC., Knoxville, Tenn., produces various types of concrete products, including irregularly shaped slabs, joists and other items which cannot be produced with completely automatic equipment. To facilitate the many handling operations and the moving of raw materials and finished products, the company utilizes three powered "Prime-Movers" with dump buckets and intermediate platforms.

Concrete for items such as precast joists is hauled by Prime-Movers from a central mixer to forms set up

Pouring septic tank; concrete is transported to casting site in small power truck

in the yard area. To get concrete to the top of the large septic tank molds, a 20-percent grade ramp was constructed which serves as a permanent installation for transporting concrete direct from the mixer to the molds. Prime-Movers with platforms are used for transporting, relocating and loading block and other finished concrete products over rough ground and in confined areas where the company's five fork lift trucks cannot operate.

## Tail Pulley Take-Up

THE ILLUSTRATION shows a very simple method of providing a take-up for a belt conveyor. The one shown is installed on the tail end of a field belt. The diameter of the pulley is kept small in order to save weight, and the legs of the conveyor support are very short, with the return belt barely clearing the ground. The tail pulley assembly is mounted on an independent section of the frame which is approximately 8 ft. long. This short frame slides in a long, horizontal slot

Tail pulley assembly is mounted on independent section of frame

that is a part of the longer belt conveyor frame. After the belt has been pulled taut, the two sections are then spot-welded together.

## Guarding Against Premature Blasts

FOR THE PAST SEVERAL YEARS there has been speculation in the quarry industry relating to the possibility of mobile radio transmitters being the cause of premature blasts. Evidence has been presented to show that under certain "ideal" conditions the high frequency waves from cars equipped with police radio, or an intracompany mobile communication system, might possibly set up currents of sufficient magnitude to detonate an electric cap.

Should a killing premature blast occur, the operator will usually take no further chances, theory or no theory. At the site where this picture

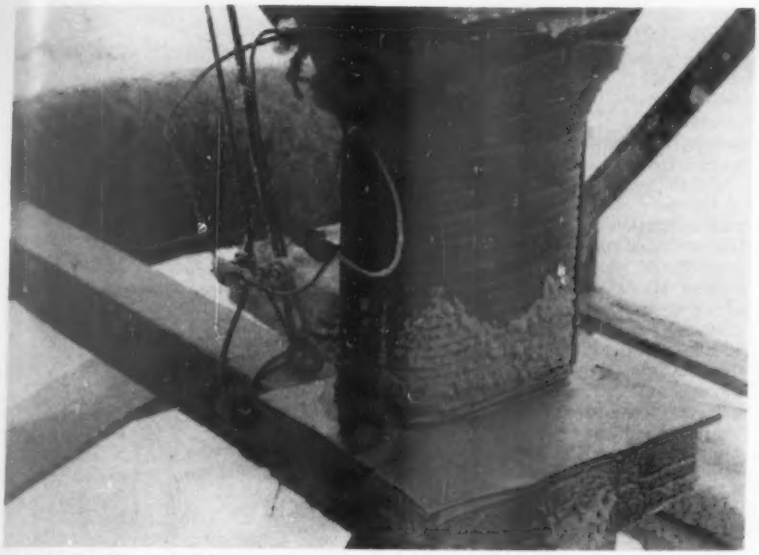
Caution sign warns drivers to turn off short wave radios about two or three miles from site of operation

was taken a premature blast had killed several men and injured many more. Even though lightning was blamed as the cause of the accident, the operator is playing it safe by posting a warning sign which asks drivers to turn off their transmitters about two or three miles from the site of operation.

Left: I-beam extends over hood of truck while enroute. Right: I-beam is moved back for unloading of burial vault

## Burial Vault Handler

AT THE OPERATION of Central Builders Supply Co., Sunbury, Penn., burial vaults are one of the company's products. This branch of the business is a one-man operation, from fabrication and casting to delivery at the site. To facilitate handling the concrete vaults, a steel lifting shackle and chain block ride a steel I-beam. When the delivery truck is enroute, this I-beam extends out over the hood of the truck, as shown in one of the illustrations. When the vault is to be unloaded, the I-beam can be moved back, as shown in the other illustration, enabling the vault to be unloaded quickly and safely. A gear and pinion, driven through a hand winch, is used to move the I-beam back and forth. This arrangement not only provides an efficient unloading system, but also removes a dangerous traffic hazard to motorists who might be following the truck.



Heating cable, encased in specially designed jacket, prevents sand from freezing in pipes

## Keeping Discharge Pipes Open

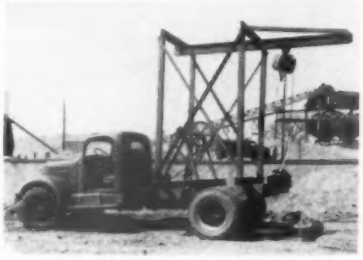
TO PREVENT SAND from freezing in the discharge pipes of dewatering towers at its Manumuskin, N.J. plant, George F. Pettinos, Inc. has installed lead-covered heating cable, encased in a specially designed jacket.

Sixty-foot lengths of G-E heating cable were installed in a sheet-metal form which was fitted over the two 2-in. discharge pipes and a section of the lower part of the tank. Prior to installation the heating element was given a protective weather-proofing with a coat of cork granules in a mastic insulating material. This coating also serves to retard heat dissipation to the outside air. Control of the heaters is manual. A switch at the classifier control board permits the operator to turn on the heaters at each dewatering tower when the outside temperature drops below 28 deg. As claimed by the company, the heating cable keeps the discharge pipes free of frozen sand at temperatures well below zero.

The method previously used in keeping the pipes open in sub-freezing weather was to send a mechanic to the top of the 50-ft. dewatering towers with a heavy-duty blow torch to thaw the frozen sand.

## Field Belt Handler

THE USE OF field belts in an area where deposits are relatively thin often means that for one month's production many acres of ground may need to be worked. For awhile, segments of the conveyor belt can be "inched" about with the loading equipment, but eventually the belt assembly must be taken apart and the section moved to its new location. To facilitate the transporting of the belt, one operator in the Texas coastal area has mounted a hand winch on the chassis of a truck. This permits



Winch arrangement for handling rolls of field belts

long sections of heavy belting to be rolled up easily by backing the truck as reeling proceeds. For transporting the reel, a steel I-beam assembly and chain block are used.

## Flowmeter

**By Paul C. Ziemke**

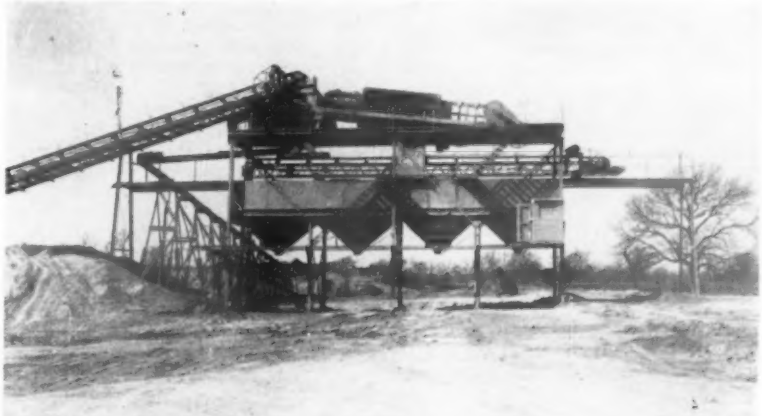
WITH COOLANT WATER being wasted to the storm sewer, the engineer has no great concern about the cold water flow, with the exception of seeing that an ample supply is coursing through the water jackets. Usually he is aware of the flow characteristics by the use of the conventional open funnel device in which a vane-type switch may be inserted to sound a warning should the supply fail for any reason.

Often, though, the installation is dependent for water from the plant well where conservation is necessary. The engineer may be required to operate a closed system where the cooling tower is a feature, or where the heated water is used for process work in the production line. In either case he will be concerned about the water supply maintained through his compressor. One solution is the use of a flowmeter of the rotometer type with which extremely good visibility can be had for considerable distance.

With the rotometer located near the thermometer, the engineer may soon adjust his water demand to suit the optimum temperature requirements for the load and the brand of oil in use. One individual inserted a Fulton-Sylphon bellows type thermometer in series with the rotometer.

## Shuttle Loading Belt

THE ILLUSTRATION below shows a final rinsing rotary screen at a southwestern sand and gravel operation. Directly under the rinsing screen and supported by the four steel truck hoppers is a horizontal shuttle belt that can be moved out over the railroad track for loading open gondolas, or it can be shuttled in the opposite direction to fill the bins. The rinse water is wasted. The assembly makes a simple and efficient loading plant for small operators.

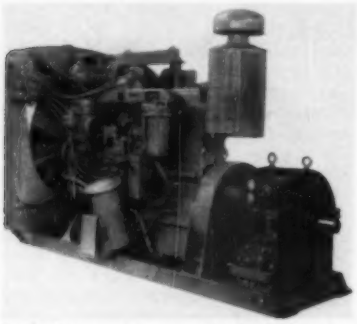


Truck hoppers under final rinsing screen support horizontal shuttle belt which can load either open gondolas or bins

# NEW Machinery

## Torque Converter

THE TORCON CORP., 1199 W. Fifth St., Ashtabula, Ohio, has added the Model 17-K single-stage, three-element type unit to its standard line of torque converters. The unit combines an hydraulic torque converter and hydraulic coupling. It has a variable torque ratio up to 3:1. At zero output speed, the torque multiplication is highest and this gradually decreases with increasing output speed until a point is reached where the output and input torques are equal. When the torque ratio reaches 1:1, the reaction member is free wheeled and the unit acts as a hydraulic coupling. In the coupling range, output speed increases in nearly direct proportion to engine speed.



Hydraulic torque converter (right, shown connected to a diesel engine)

Major elements of the unit consist of the converter pump, converter turbine and reaction member. The bearings are designed so that sprocket or gear drive can be attached to the output shaft without the necessity of an outboard bearing. The chain-driven oil circulating pump is mounted on a base plate. The converter uses standard S.A.E. 10 motor oil and incorporates a built-in oil filter and temperature and pressure gauges. It can be modified to meet the specific requirements of individual applications. The Model 17-K can be used with gas or diesel engines rated up to 300 hp.

## Medium-Duty Truck

GMC TRUCK AND COACH DIV., General Motors Corp., 660 S. Boulevard, E., Pontiac 11, Mich., has announced a medium-duty GMC truck with the same compression engine used in the latest Army 6 x 6 tactical military truck. The model, called the 472-30, is a highway tractor whose 302-cu. in. gasoline engine, developing 145 hp., is rated at 21,000 lb. gross vehicle weight and 45,000 lb. gross combination weight as a truck or highway tractor, respectively. The lightweight engine has a compression ratio of 7.2 to 1 and operates on standard gasoline.

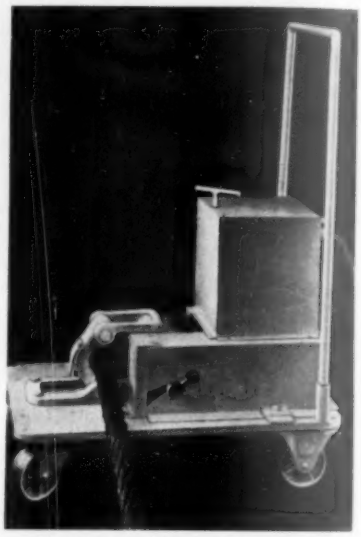
## Crushing and Screening Plant

IOWA MANUFACTURING CO., Cedar Rapids, Iowa, has announced the Cedarapids Model DJ-50. It is a portable three-unit plant, consisting of a crushing and screening unit, a single-screw, fine material washer and a two-compartment bin and conveyor unit. The crushing and screen-unit includes a Cedarapids 1840-640 dual jaw crusher and a Cedarapids horizontal vibrating screen with the vibrating mechanism underslung to cut travel height to the minimum. Capacities range up to 50 t.p.h. or more, and the plant produces two sizes of graded aggregate plus washed sand. The dual jaw crusher has two crushing chambers—an 18- x 40-in. primary, and a 6- x 40-in. secondary—both in one base, with one eccentric shaft. The secondary chamber takes the place of a roll crusher, and with both primary and secondary crushing accomplished by one unit, the weight is necessarily reduced. The unit was originally designed for military use by the Army Corps of Engineers.

Crushing and screening plant designed to military specifications

## Wire Rope Cutter

PELL CABLE CUTTER CO., 820 Sharon Bldg., 55 New Montgomery St., San Francisco 5, Calif., is producing an electric motor-driven wire cutter called "Hydrashear." Retaining the advantages of portability of the regular line, the electric model will cut up to and including 1¾-in. wire rope in 20 sec. It is powered with a ½-hp. 110/220-volt, single phase motor driving hydraulic pump which develops 10,000 p.s.i. pressure, and can be plugged into any electric circuit. No special wiring is required.



Electric motor-driven wire rope cutter

The unit is furnished skid-mounted and is arranged for mounting on either casters or wheels. It is approximately 24 in. long, 15 in. wide and weighs about 135 lb.

Upon completion of cut the motor of the unit automatically turns off. When the release valve is opened the blade retracts and is ready for another cut.

## Vibration Measurement

MARTIN ENGINEERING CO., Kewanee, Ill., has developed a pocket-size instrument for measuring the speed and amplitude of vibration on machinery or on bins and hoppers where vibration is produced intentionally to aid materials movement. The vibration "slide rule" is called the Fowler "Vibra-Tak." The instrument is 6¼ in. long and has a movable tuning slide that indicates on a number scale the speed of vibration. To operate, the bullet nose is placed against the vibrating object



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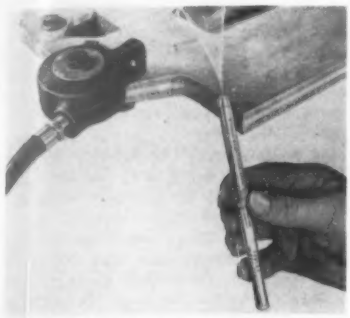
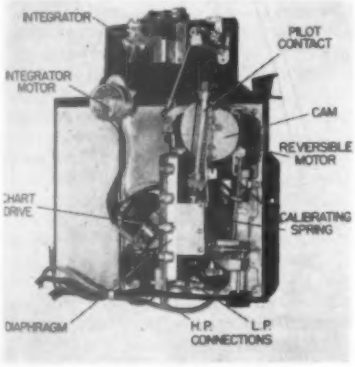


Vibration measuring instrument

and the tuning slide is moved up and down the scale until the wire reed, which extends out of the nose as the slide is moved, reaches the maximum "throw." The scale reading is then multiplied by 1000 to get the vibration in cycles per minute, or shaft speed in r.p.m. The arc through which the reed "throws" is directly proportional to amplitude. It has a range of 2000 to 15,000 c.p.m. Higher speeds register and can be closely estimated. The instrument reveals "dead" spots on equipment where vibration is induced and also aids in the locating of unwanted vibration on other equipment.

## Flow Meter

THE HAYS CORP., Michigan City, Ind., has designed a low differential flow meter for measuring air flow, gas flow or recording the ratio of air




Low differential flow meter

flow to gas flow. The Diaflow is used as a guide in achieving product, process and cost control. It utilizes the pilot method of operation whereby no load is placed on the measuring element. It uses a dry diaphragm type measuring element, thus no water, oil or mercury is required and leveling is eliminated. Unit construction has been used throughout. By means of a pivoted, swinging frame, internal parts are accessible from the front of the case. The unit can be provided with two flow elements so that the gas and air flow records can be combined and coordinated for efficient combustion.

The measuring element is the manufacturer's differential type diaphragm which will accommodate static pressures up to 10 p.s.i. and differential pressures up to 20 in. water. A single heavy-duty fine silver wiping contact converts the diaphragm differential into an electrical impulse which energizes the reversing motor to provide the power required for the meter.

The capacity type motor which is specially built for this "reversing duty" has a squirrel cage type rotor and a fully enclosed lubricated gear train. Normal variations in voltage and frequency have no noticeable affect on its operation, it is claimed. A cam is incorporated to change the square-root relationship between differential pressure and flow to an equal-increment flow record.

## Dry-Type Transformer

WESTINGHOUSE ELECTRIC CORP., P.O. Box 2099, Pittsburgh 30, Penn., has announced an enclosed, non-ventilated dry-type distribution transformer for service on secondary circuits rated 600 volts and below. Designated as type E, the new transformer supersedes the type AJR line of dry-type transformers. The transformer utilizes Hipersil cores and class H silicone insulation and operates at 120 deg. C. rise. Both high- and low-voltage leads are brought to Micarta laminated plastic terminal boards at the bottom of the case. Conduit knockouts are located at the bottom of the case walls. In addition to the 3-, 5-, and 10-kv.-a. AJR sizes superseded, the type E will also be built in 15-, 25-, 37½-, and 50-kv.-a. ratings.

## Conveyor Pulley

THE AMERICAN PULLEY CO., 4200 Wissahickon Ave., Philadelphia 29, Penn., has added a new Type "HD" heavy-duty conveyor pulley with Wedg-Tite tapered hubs to its line of solid welded-steel conveyor pulleys. This unit is designed for large conveyor installations where horsepower and tonnages run high. The hubs are of split-tapered construction for rapid installation and removal of the conveyor pulleys. The hubs are drawn into position by eight high-tensile alloy-steel cap screws. The pulley is totally enclosed and is manufactured in sizes up to 6 in. diameter x 63 in. face, and for shafts up to 10 in. Non-standard sizes are available if required.

New pulley for large conveyor installations

## Dragline

HARNISCHFEGER CORP., 4460 W. National Ave., Milwaukee 14, Wis., has announced its model 1855 dragline, reportedly the largest ever mounted on a single pair of crawler frames. The machine has four separate Magnetorque units which control all movements. The equipment has a working weight of 600,000 lb. and is capable of handling an 8-cu. yd. bucket with a 120-ft. boom or a 7-cu. yd. bucket with a 150-ft. boom. It is powered by an 8-cylinder Cooper-Bessemer FV8 diesel engine which develops 590 hp. at 900 r.p.m. Ground pressure developed by the unit is 16.2 p.s.i. The hoist line speed is 246 f.p.m. with a digging line speed of 199 f.p.m. The hoist line pull is 75,600 lb. and the digging line pull 93,500 lb. Traveling speed is .5 m.p.h. while its rotating speed reaches 3.54 r.p.m.

Large crawler-mounted dragline

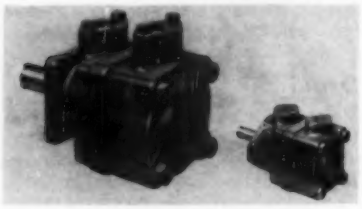
## Weather-Protected Motor

ALLIS-CHALMERS MANUFACTURING Co., Milwaukee 1, Wis., has designed a weather-protected motor for keeping wind-driven heavy moisture out of windings. Its intake velocity has been reduced to less than 600 f.p.m. Air moves upward through side intakes into an expanded air space, further lowering its velocity.

To prevent dust and dirt from entering the machine, the air intakes are located at a considerable height above ground level. No special concrete foundation or base is required with this motor.

## Hydraulic Motors

VICKERS, INC., division of the Sperry Corp., 1600 Oakman Blvd., Detroit 32, Mich., has brought out the first units of a new line of vane-type hydraulic motors. The construction utilizes heat-treated alloy steel for shaft, rotor and vanes. "Rocking beam" con-



Vane-type hydraulic motor

struction keeps all vanes in intimate contact with the cam ring at all times, it is claimed. Mounting adaptability is provided by a choice of four combinations of inlet and outlet port positions, and choice of flange or foot mounting and either direct, belt, chain or gear drive. The motors are available in two series, M2-200 and M2-500, for 5.0, 6.5 and 26 hp. output.

## Conveyor Belt

NEW YORK BELTING & PACKING Co., 1 Market St., Passaic, N.J., has placed a new type conveyor belt on the industrial market. It is claimed to be virtually rip-proof. It is designed for use where conveyor belts may be subject to severe ripping or tearing action by foreign objects. The belt has special carcass which has multiple strands of high tensile steel wires imbedded at 3-ft. intervals.

## Dump Truck

COOK BROTHERS EQUIPMENT Co., 1815 N. Broadway, Los Angeles, Calif., has announced production of its M-310 dump truck. Total legal payload capacity is increased by shifting a portion of the payload weight to the front. A heavy-duty front axle has been provided to absorb this greater weight. The truck is equipped with a Ford 317 V-8 overhead

Dump truck with 174-in. wheelbase

valve, 155-hp. engine. A choice of the manufacturer's dual gear drive, dual center chain drive, or double reduction axle with third axle attachment, is offered according to purchaser's requirements.

Wheelbase is 174 in. but it can be changed to meet specific state requirements. The truck is equipped with the manufacturer's hydraulically-powered telescopic hoist.

## Smoke Indicator

COMBUSTION CONTROL CORP., 720 Beacon St., Boston 15, Mass., has announced a photoelectric smoke indicator, series FE, which continuously

Photoelectric smoke indicator

indicates the density of smoke passing through the stack of a power plant and signals when the smoke density exceeds a preset value.

The indicator consists of three basic units: a light source, a photoelectric scanner, and a control and indicator combined in a single housing. The first two are mounted on opposite sides of the stack or breeching and the indicator is placed at any convenient location. The density reading can be read on a 4½-in. indicator scale in both Ringelmann numbers and percent of smoke density.

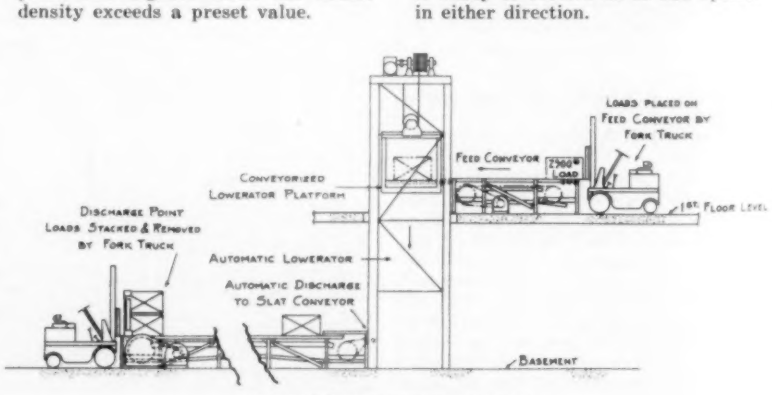
The alarm can be set to operate at any predetermined value of smoke density from 10 to 100 percent light cut-off. Supply voltage is 115-230 volts, 60 cycles, operating range is 20 ft. maximum between light source and photoelectric scanner, there is a single-pole, double-throw relay, and the contact rating is 5 amp. 115 volts, 50/60 cycles non-inductive 60-watt lamp load.

## Wire Cup Brush

HEWITT-ROBINS INC., Buffalo 5, N.Y., has developed a wire cup brush with replaceable filler for the removal of rust, scale, paint and welding slag from railroad equipment, tanks, gears and other metal surfaces. The brush consists of inner and outer metal adapters with a replaceable cup-shaped filler in which the wire bristles are anchored in place with rubber. It is available in wire gauges ranging from .014 to .028 in.

## Conveyor System

GIFFORD-WOOD Co., Hudson, N.Y., has announced an automatic lowerator-conveyor system. The system comprises three major units: (1) the lowerator, (2) a feeder conveyor, and (3) a take-off conveyor. All three units are automatically interlocked and controlled by electric eyes and limit switches so that when the feeder conveyor receives a load it automatically delivers it to the lowerator. This automatically descends and delivers the load to the take-off conveyor, from which it is removed for storage, etc. One element of the system will not discharge its load until the next is ready to receive it. It can operate in either direction.


LOADS PLACED ON FEED CONVEYOR BY FORK TRUCK
FEED CONVEYOR
CONVEYORIZED LOWERATOR PLATFORM
1ST. FLOOR LEVEL
DISCHARGE POINT LOADS STACKED & REMOVED BY FORK TRUCK
AUTOMATIC LOWERATOR
AUTOMATIC DISCHARGE TO SLAT CONVEYOR
BASEMENT

Automatic lowerator-conveyor system



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## Arc Welder

GENERAL ELECTRIC CO., Schenectady 5, N.Y., announces a 200-ampere, engine-driven d-c arc welder with a 60 percent duty cycle. Designated as type WD-42AGW, the new welder has a current range of 40 to 250 amperes, and can be used with a variety of electrode sizes for repair, maintenance and construction work. Consisting basically of a G-E type WD42 generator and a Wisconsin air-cooled engine, it is designed to fit crosswise in a standard pick-up truck.

Forced ventilation keeps internal temperature within safety limits when the welder is operated on a 60 percent duty cycle at rated load. In addition, tests indicate that heavy overloads for short periods do not produce harmful results.

Engine-driven d-c arc welder

Either the generator or engine can be removed for overhaul and replaced by a standby unit. Since the engine is air cooled, coolants or anti-freezes are not required. A vacuum-type device saves gasoline by idling the engine when welding is not being done.

## Electronic Scales

COX AND STEVENS AIRCRAFT CORP., P.O. Box 30, Mineola, N.Y., is manufacturing electronic type scales for weighing trucks and railroad cars. Truck platforms are supported by four or six electronic weighing cells depending upon capacity. These 6-in. high cells are hermetically sealed and contain permanent resistance wire strain gauge units which transmit the weight impulse to the indicator.

Truck scale capacities range from 10 to 50 tons. Track scales go as high as 400 tons. All standard platform and weighbridge sizes are available in each category.

For check weighing and modernization the electronic equipment may be installed in most existing track lever type scales. Visual and printed weights are offered in the MP-1 model. Standard tolerances are guaranteed and weights in the 100,000 lb. range may be printed and read in 5 lb. increments. On 200-ton track scale

Equipment for electronic weighing of trucks and railroad cars

equipment weights may be printed to the nearest 50 lb. Electronic equipment, similar in principle, is also commercially available for fully automatic motion weighing of both trucks and freight cars.

## Bin Level Control

THE FOXBORO CO., Foxboro, Mass., has developed a control system that automatically measures and controls the bin level of fly ash collected in a precipitator. A temperature bulb, mounted inside the precipitator, normally senses the higher temperatures of the flue gases from which the dust is precipitated. When the dust deposit covers the bulb (acting as insulation) the controller, responding to the resulting lower temperature, completes an electrical circuit to sound an alarm and alert the operator.

If desired, the controller can be installed to operate a screw conveyor, belt or other motor-driven equipment automatically emptying the bin or tank when the desired level is reached. The system is equally effective for most bulk materials, it is claimed, provided their temperature in the bin is considerably above or below the ambient temperature.

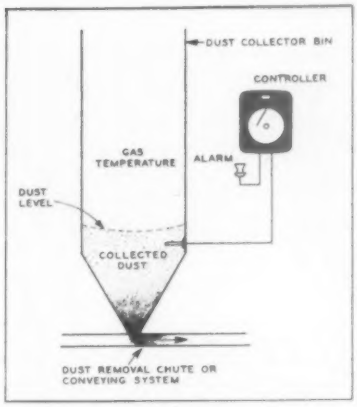
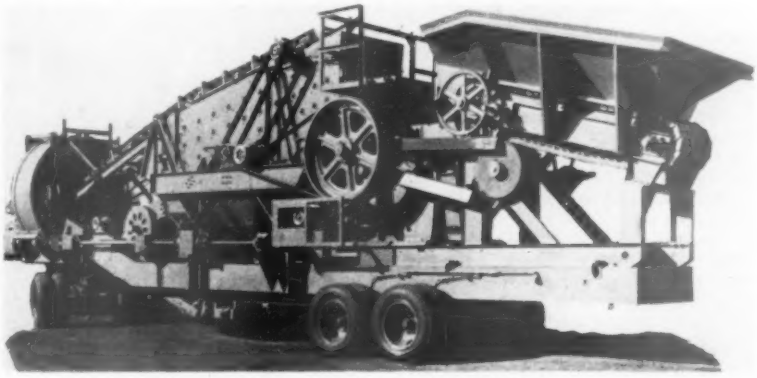



Diagram of dust level control system

## Portable Crushed Stone Plant

UNIVERSAL ENGINEERING CORP., Cedar Rapids, Iowa, division of Pettibone Mulliken Corp., has added to its 293QH Series Limerock portable plants. The new plant features an 18- x 30-in. roller bearing jaw crusher, an 18- x 31-in. hammermill, and a 4- x 10-ft. three-deck vibrating screen with ball tray. Special bypasses are built in to give product control, making it possible to produce agricultural limestone, road stone and chips simultaneously, agstone and chips, agstone and road stone, or all agstone.

The primary jaw crusher, apron feeder with by-pass, operator's platform and structural supports are mounted as a separate unit, on skids, which is bolted to the main frame. The plant features drives with side drive through universal joint connection from truck mounted power. Feed is direct from shovel or by dump trucks from ramp.



New size portable crushed stone plant

## High-Slip Motor

GENERAL ELECTRIC CO., Schenectady 5, N.Y., has announced the development of a totally enclosed, fan-cooled, high-slip induction motor designed for use in acceleration of high-inertia loads such as punch presses, centrifuges, hoists, etc. Designated Type KRX, it is claimed to be lighter and smaller than conventional motors of similar construction. In the motor, low-resistance rotor bars are extended outside the housing away from the dust. Drive is through a flexible coupling and the pulley runs true. Positive vibration is achieved by an unbalanced weight.

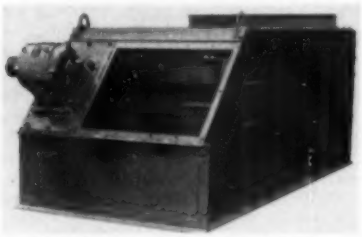
The machine weighs 7500 lb., is 62 in. high at the feed end and 56 in. at the discharge end. It is 12 ft. long and has a width of 68½ in. The unit is furnished with V-belt drive and mounts for the 10-hp. motor.

Cutaway view of motor showing extended bar construction

ed on one end and pass through a rotating baffle plate. Beyond the baffle plate the bars are brazed to strips of high-resistance metal, shaped to form a radial-blade fan. The motor is available in 30 to 150 hp. at 900 and 1200 r.p.m., 5-8 and 8-13 percent slip. Voltage ratings are 220, 440 and 550.

## Vibrating Rod Grizzly

NORDBERG MANUFACTURING CO., Milwaukee 7, Wis., is producing the "Symons" Type K-RG vibrating rod grizzly which is designed to scalp in excess of 400 tons of material an hour. Applicable for separations from ½ in. upwards to about 4 in., it is suited



Vibrating rod grizzly scalps 400 t.p.h.

for service following most sizes of primary crushers and for use ahead of secondary crushers, the manufacturer states. It serves primarily as a single cut scalping unit but it can accomplish a limited number of separations. A large feed intake opening and clearance between the power unit and the screen deck permit an unobstructed flow of material up to 12 in. feed size.

The grizzly is built with a 50 in. x 8 ft. screening surface using ½-in., ⅝-in. or ¾-in. spring steel rods in three bays. The rods are held in place with a built-in screw clamping device. The vibrator unit is located at the discharge end of the grizzly. Motor and drive for the vibrator are installed

## Burner Air-Fuel Control

ORR & SEMBOWER, INC., Morgantown Road, Reading, Penn., has introduced a boiler that incorporates low-fire starting. A pressure controlled potentiometer positions the damper motor which adjusts the fuel valve and air damper according to steam demand as reflected by boiler pressure. The fuel and air ratio to the air atomizing oil and premix gas burner with which the boiler is equipped is proportioned for efficiency at all intermediate points from 100 percent full load firing rate down to 30 percent of full load. The mechanism is an adjustable cam which positions the fuel valve and an adjustable linkage which positions the air damper.

## Automatic Control

REEVES PULLEY CO., 1015 N. Wilson St., Columbus, Ind., has announced the addition of the Conoflow control to its line of automatic controls. The control is available on all integral horsepower Vari-Speed Motodrives for use in conjunction with instrumentation air pressure of 3-15 p.s.i. The drives have 6:1 maximum speed ranges on all units with capacities to 25 hp.

With this control the drives are able to control liquid levels in tanks, whether of the open or enclosed types. It makes it possible to use the Motodrives for automatically controlling flow proportioning systems of liquid, gas, chemicals, grain, etc., as well as pressure and temperature.

Connection is made direct to Conoflow cylinder on the drive from a pneumatic controller. The cylinder is

Instrumentation air supply control

pre-lubricated. This type control may be operated from the present air supply in a plant, and it can be connected to any pneumatic control instrument.

## Portable Yard Ramp

MAGNESIUM COMPANY OF AMERICA, 1515 N. Kilpatrick Ave., Chicago 51, Ill., announces the addition of the Magcoa portable magnesium yard ramp to its line of materials handling products. The ramp may be obtained in five standard sizes, all of which are 30 ft. long but vary in widths of 60 and 70 in. Capacities range from 6000 to 16,000 lb., capacity being the combined weight of the load and the materials handling equipment transporting the load.

Quarter round safety curbs with inner edges rounded to protect equipment are used along the top sides of the ramp. The ends of these curbs are capped with an end casting which tapers to each corner of the ramp. Strength is obtained by bridge-type underbracing. A large wheel on each side of the ramp balances the weight, permitting one man to push and roll the ramp to the desired position for use.

In use the ramp is positioned in front of the freight car door and one end is raised by means of an hydraulic lifting mechanism. The lower end is on the ground which prevents it from being forced out of the car during loading operations.

Portable magnesium yard ramp



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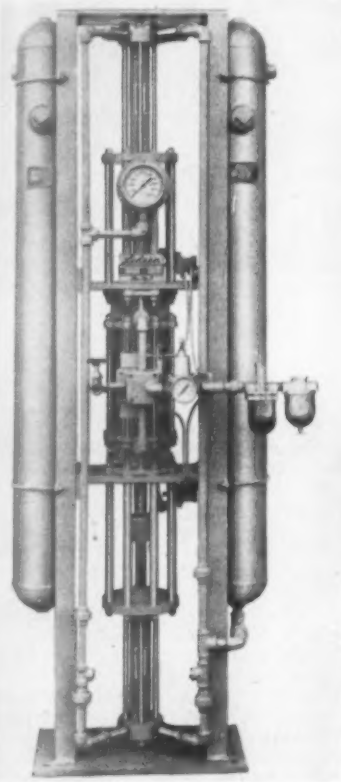
## Air-Hydraulic Pumps and Power Units

LEDEEN MANUFACTURING CO., 1600 San Pedro St., Los Angeles 15, Calif., announces a new series of heavy-duty,



Heavy-duty air-hydraulic pump and power unit

air-hydraulic pumps and power units designed to develop high fluid pressure from low air pressure. The units are suitable for operation of high pressure cylinders, clamps, valves, actuators and hydraulic presses; for safety installation and high pressure testing; for special hydraulic circuits requiring variable and adjustable pressure and volume; and for long pressure-holding cycles with quick approach without overheating or churning the hydraulic fluid.

These pumps and power units are available in horizontal construction for minimum head room, and vertical construction for minimum floor space. Normal air pressure is suitable.

## Salamander

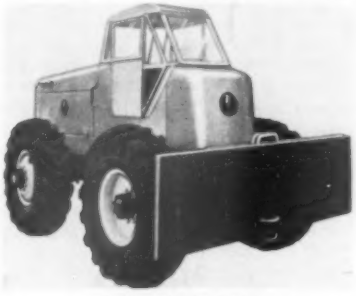
CALIFORNIA HEATER CO., 1511 E. 2nd St., Pomona, Calif., is marketing a salamander which burns diesel oil, No. 1 stove or range oil, kerosene or any other light grade of fuel oil. The distilling type smokeless salamander has a heavy iron flame spreader inside the base of the stack and diagonal graduated louvers which cause the

Distilling type salamander

flame to burn in a rapidly spinning spiral. It lights with a match and is claimed to burn 10 to 20 hr. on one filling of oil. Burning rate is regulated by air intake cap on bowl. The manufacturer claims it will produce 100,000 B.t.u. per hr. on ¾ gal. of fuel oil.

## Tractor

THE FRANK G. HOUGH CO., 801 Sunnyside Ave., Libertyville, Ill., has announced a rubber-tired tractor with four-wheel drive. Known as the Model TM "Payloader" tractor, it is available with a 106-hp. gasoline engine or a 90-hp. diesel engine. It weighs



Rubber-tired tractor

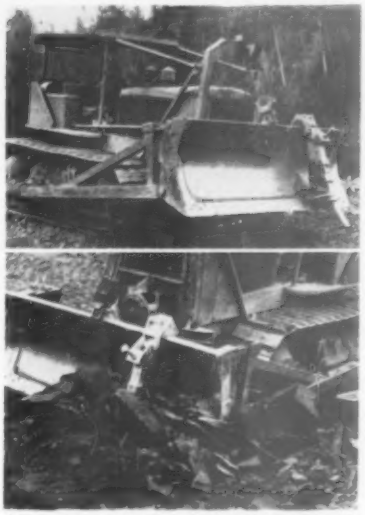
25,000 lb. and develops up to 16,000 lb. and 14,000 lb. drawbar pull, with gasoline and diesel engine, respectively. The tractor has a full reversing transmission, providing four gear ratios in both forward and reverse; it has speeds up to 27 m.p.h., and has torque converter drive and rear wheel steering with hydraulic power booster.

## Architectural Sales Tool

ARCHITECTURAL MODEL MATERIALS, INC., 4208 West Armitage Ave., Chicago 39, Ill., has created realistic scale models used for building miniature factories, stores, houses, farm buildings, etc. These models are fabricated of wood and plastics to exact scale and produce realistic three-dimensional models. The scale models are valuable for advertising, sales promotion, display, engineering, financing and many other uses.

## Dozer-Rooter

ELECTRIC STEEL FOUNDRY CO., 2141 N.W. 25th Ave., Portland 10, Ore., has announced the Esco Buck Forte dozer-rooter. The device is a heavy-duty tooth shank housing which mounts on the moldboard of a bulldozer by means of a special clamp used in combination with adapters and saddles which enable it to fit most popular makes of heavy-duty bulldozers. The rooter shank has four adjustments of ripping depths below

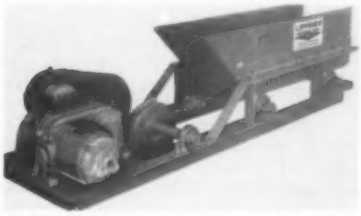


Heavy-duty bulldozer-mounted ripper tooth

the bulldozer's cutting edge and is equipped with the manufacturer's box-type replaceable points. Rooters can be attached in pairs or used singly.

## Plate Feeder

LIPPMANN ENGINEERING WORKS, 4603 W. Mitchell St., Milwaukee 14, Wis., has developed a ball bearing



Reciprocating plate feeder equipped with ball bearings

equipped 20 in. x 5 ft. reciprocating plate feeder with babbitt lined eccentric drive. Driving it is a 3-hp. variable speed electric motor gear reducer with belt drive operating over adjustable pitch sheaves for finer feed control of pit-run material. A dial indicates speed variation. A completely enclosed oil lubricated chain drive transmits power to the eccentric shaft from the speed reducer.

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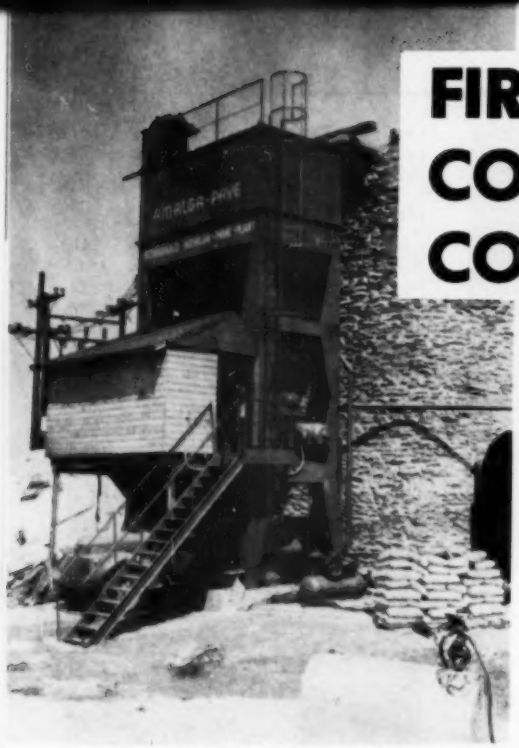
# FIRST NEW ENGLAND COLD-MIX ASPHALTIC CONCRETE PLANT

**California-developed process is installed at plant of Dunning Sand & Gravel Co., Wauregan, Conn.**



A rock wall forms the back support for the asphaltic concrete installation and trucks deliver aggregates directly to the bins on top

A GOOD EXAMPLE of how a producer of aggregates might diversify by capturing new markets for certain size ranges and give added service to his customers at relatively low cost is a new activity undertaken by the Dunning Sand and Gravel Co., Wauregan, Conn. An Amalga-Pave plant for the production of cold-mix asphaltic paving mixtures, placed into operation at the company's sand and gravel plant in July of this year, is unique in two respects.

It is the first plant in the United States placed into operation by an aggregates producer under an Amalga-Pave plant arrangement, and it is the first plant of its kind to be installed in the northeast. Similar plants using this relatively new process, however, have been installed by producers in the far western and Rocky Mountain states and in Oklahoma. Exclusive licenses have been granted to aggregate producers to install Amalga-Pave plants in a number of other states as well as in United States territorial possessions.

## The Process

The process is a 100 percent cold mix method of producing asphaltic paving materials which was developed by the Union Oil Company of California, and is being marketed by National Amalga-Pave, Inc., Beverly Hills, Calif. No heat is required in either the mixing or laying operations which means production of a product without smoke and a minimum of dust, which can be marketed over a considerable radius from the plant.

The mixtures comprise graded aggregates, a powdered asphalt and "B.G.S." liquid flux oil, the latter two materials being introduced separately into the mixer with the aggregates. The liquid flux oil "amalgamates" or combines with the powdered asphalt in the formation of the binder for the aggregates, and it is this action which has given the coined name for the process.

These mixtures are said to be amenable to stockpiling or shipping by truck or rail for long distances without setting up in stockpiles or in transit. The product is claimed to resist oxidation, to retain its original penetration for many years, to withstand the hot summer sun without bleeding and will set up only under consolidation by rolling and subsequent traffic.

This process of producing paving mixtures was selected by the Dunning Sand and Gravel Co. because the mixtures lend themselves to shipping over a wide area in serving many communities and are not limited by the necessity for maintenance of any temperature control.

Plant location is far from any metropolitan area and the market for the product is being developed throughout eastern Connecticut and parts of Rhode Island. Other factors were the ability to stockpile mixtures for indefinite periods as an aid to serving maintenance jobs of the several government agencies in the area, and the elements of plant investment and costs of operation.

National Amalga-Pave, Inc., licensor of the process, set up an affiliated company in May of this year, Amalga-Pave Equipment, Inc., to purchase new processing plants and to lease them to licensees on a rental per ton basis. The lease-per-ton rate is on a sliding scale and, in the case of Dunning, applies to sales made in three eastern Connecticut counties.

## Plant

Richard B. Dunning, owner of Dunning Sand and Gravel Co., leased a 3000-lb. plant which was manufactured by Standard Steel Corp. and shipped from Los Angeles on one railroad flat car in prefabricated sections for ready assembly. At Wauregan, a masonry wall was built to retain an earthen ramp which permits trucks to discharge directly into the 3-compartment aggregate bin.

Graded aggregates are supplied from stockpiles, normally carrying from 4 to 6 percent moisture, which presents no problem since the flux oil used has the capacity to displace moisture on the surfaces of the aggregates. One of the requirements for most asphaltic concrete mixes, including Amalga-Pave, is a fine mineral filler carrying a certain fraction of minus 200-mesh particles. For best performance the sizing specification would be typically about as follows:

Combined Mineral Aggregate

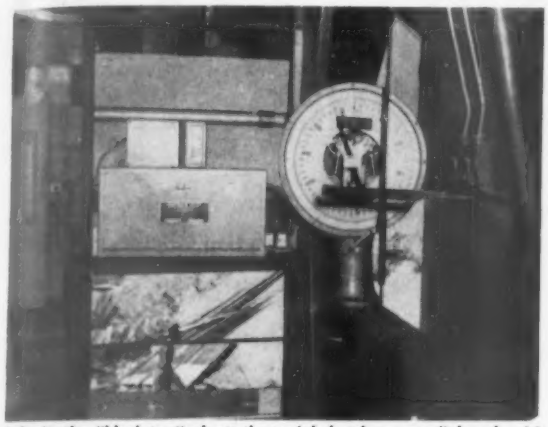
| Sieve size | Percentage passing sieves | | | |
|---|---|---|---|---|
| | ¾ in. | ½ in. | ⅜ in. | No. 4 |
| 1 in. | 100 | | | |
| ¾ in. | 95-100 | 100 | | |
| ½ in. | | 95-100 | 100 | |
| ⅜ in. | 67-85 | 80-95 | 95-100 | 100 |
| No. 4 | 50-65 | 57-78 | 65-85 | 95-100 |
| No. 8 | 37-50 | 42-59 | 47-65 | 62-92 |
| No. 30 | 18-28 | 21-34 | 25-39 | 31-47 |
| No. 200 | 3-8 | 4-9 | 5-12 | 6-14 |

The Dunning sand and gravel operation is experimenting on the recovery of a minus 200-mesh sand but, temporarily, is using a finely pulverized limestone product as a filler. An attempt will be made to process the overflow from dewatering and classifying screws in the recovery of fines.

Hard asphalt in lump form is delivered by dump truck from the East Providence refinery of Socony-Vacuum Oil Co. It is stored in the open and fed into the plant as required. The preferred specification, generally, for this component is as follows:

Powdered Asphalt or Powdered Gilsonite

| | |
|---|---|
| Specific gravity at 60 deg. F. | 1.00 min. |
| Softening point (R & B) | 235-300 |
| Penetration at 77 deg. F. | 0-3 |



Left: In the "black-top" plant, the weigh batcher uses dial scales (right); the scales used for weighing asphalt can be seen in the center. Right: Part of the electrical controls in the asphaltic concrete plant

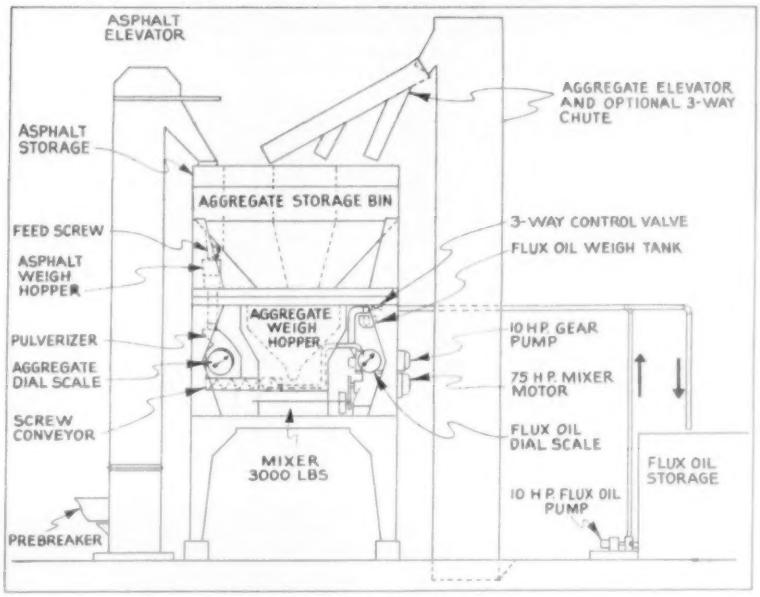
| | |
|---|---|
| Flash COC deg. F. | 450 min. |
| Solubility in $CCl_4$, % by weight | 95 min. |

The asphalt is first put through a breaker for reduction to chip sizes. It is then elevated to an overhead bin and is ready for proportioning and pulverization through a No. 14 Williams hammermill. Reduction is to 20 percent minus 200 mesh before introduction into the mix.

Liquid flux oil is a special product of the extraction process in the production of lubricating oil at the refinery. For the Wauregan operation it is supplied by the Sinclair Refining Co. and is shipped to the plant in uninsulated tank cars. The oil is pumpable at ordinary temperatures and is transferred to a storage tank below the previously mentioned ramp. A pumping system circulates the flux oil to the plant and returns to the storage tank, serving also to inject the oil in weighed batches, under pressure, into a pug mill mixer. A weighing system interlocked with the batching control circuit is the means of accurate proportioning of flux oil. The weigh batchers have Detecto dial scales and the asphalt is weighed by Hardy scales. The Standard pug mill mixer in use was designed to discharge mixed batches directly into trucks.

### Production

Dunning Sand and Gravel Co. has been in operation since 1945 and has a rated annual capacity of 250,000 tons of sand and gravel. Much of the production is in railroad ballast, the balance being of commercial sizes for various construction uses. The company supplies aggregates also to a ready-mixed concrete plant located on the property, which property is served by the New York, New Haven and Hartford Railroad. The Amalga-Pave plant is under the direction of Gordon C. Cunneen and is operated under the name of Cunneen Amalga-Pave.




Cross section of plant elevation

## Celebrates 50th Year

Traylor Engineering & Manufacturing Co., Allentown, Penn., producer of mining, milling and cement manufacturing machinery, crushers, rotary kilns, and other heavy machinery, recently published a large, cloth-bound book, entitled "Our Golden Anniversary Year," in commemoration of its 50 years in business from 1902-1952. The book is attractively illustrated and contains a record of the history and progress of the company. In addition to a resumé of the founding of the company and a brief record of its personnel, the book also traces the development and advancement of the rotary kiln and the jaw and gyratory crushers, including the first all-welded kiln shell; the rotary kiln adjustable drive base; curved plates for jaw crushers; and of the origination and patent of curved concaves and bell heads for gyratory crushers.

## Canadian Asbestos Shares on U.S. Market

Shares of Dominion Asbestos Mines Ltd., near Asbestos, Quebec, Can., have been listed on the New York Curb Market. Construction of a mill with a production capacity of 2200 tons daily is expected to be completed by next March.

Authorized capital of the company is 3,500,000 shares, of which 1,975,000 are issued. The shares are already listed on the Montreal Curb Market and Toronto Stock Exchange. After rising to a high of $5.65 in mid-September, their price levelled off in recent weeks to a range of $4.70-$4.80.

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# Holly and Sand Go Hand in Hand

## Holly orchard supplies friends and customers of silica sand company with Christmas gifts

By DANIEL G. FENTON*

Clarence R. Wolf, president of New Jersey Silica Sand Co., inspects one of the holly trees in the orchard he had planted in 1939

HOLLY has been a symbol of the yuletide season for a great many years. The New Jersey Silica Sand Co., Millville, N.J., has capitalized on this use of holly in its advertising program. Many hundreds of people think of holly and sand together because of clever advertising by Clarence R. Wolf, president of the company.

Twenty-six years ago the company sent 46 boxes of holly to customers. This holly was collected from the woodland owned by the company. The response from that Christmas gesture was so gratifying the number of boxes was increased to nearly 100 the following Christmas.

The insecure source and quality of the holly caused the company to plant its own orchard in 1939. The trees were gathered from the nearby woods and some purchased from nurseries. The orchard now has over 2500 trees ranging from 10 to 20 ft. in height. It contains varieties of American, English, Chinese, Canary Island, and Japanese holly. However, American hollies are used for the Christmas sprigs.

Over 11,000 lb. of holly sprigs were cut and sent in 1500 boxes to friends and customers during the 1951 Christmas season.

### Customers Appreciate Gifts

Recipients of these fine gifts now look forward to their box of holly to decorate home and office during the holiday season. One customer wrote, "We thought the beauty of the holly this year was unsurpassable due to its freshness and lustre. I might add that not a single person has visited us who has not commented on the beauty of the holly." Another commented, "I am certain that no other gift could have pleased so many people. Because of the generous size of the box, I was able to share the holly with quite a few of my friends. All who saw the holly were amazed at the rich green color and the profusion of berries. It arrived in perfect condition and has kept quite well." Still another said, "It certainly was a treat to us here in Oklahoma to have holly, since it is not grown here. This was shared with the office employes. It came in good condition with the berries still intact."

The company also sends small holly trees to customers and friends to landscape their homes. These are sent with the compliments of the company. Everyone receiving trees gets explicit instructions in the planting and care of holly. The company has published a booklet entitled "Practical Suggestions for Growing Holly," which is sent with the trees.

So great is Mr. Wolf's interest in holly that he has served as president of The Holly Society of America since its oganization in 1947. It now has members in 28 states. Its function is the promotion of holly for Christmas greens and as a landscape tree.

The holly orchard attracts visitors throughout the entire year. These visitors are mostly customers who are attracted by the holly and then are shown during their visit how efficiently the company's sand business is operated. This is an asset in the sale of sand for the customer to see how carefully sand is tested and graded before loading.

The orchard is cultivated, fertilized, pruned, kept free of insects, and protected from spring frost under Mr. Wolf's supervision.

This advertising idea could be adopted by other companies, using citrus fruits, apples, or some other useful product.

Over 2500 holly trees are now in the orchard on New Jersey Silica Sand Co.'s land; 1500 boxes of sprigs were sent to friends and customers during last Christmas season

*New Jersey Silica Sand Co., Millville, N.J.

# Crushing Practice and Theory

## Part XIII. Selection of quarry equipment for efficient crushing practice

By BROWNELL McGREW*

IN OPEN-CUT quarry operations the loading of the blasted rock for transportation to the primary crusher house involves either power-shovels, or hand labor—and the latter has become practically extinct, at least as far as the American quarry is concerned. Any size of primary crusher may be used for hand-loaded rock; it all depends upon how much secondary shooting, and hand sledging, the operator feels he can afford. So-called "one-man" stone—that is, stone of a size that can be lifted into small cars or carts by the average laborer—can be handled through a 10- or 13-in. gyratory crusher, or a jaw crusher of equivalent receiving opening. Usually, for hand-loading operations, capacity and product size govern the choice of the primary crusher. The unit labor cost of feeding hand-loaded stone is higher for small crushers than it is for larger machines but, if the labor market is such as to permit hand-loading in the quarry, a little additional labor at the crusher will not add materially to the cost of production.

In the American quarry, gravel pit, and open-cut mine, the power shovel, supplemented to a lesser extent by other types of excavating equipment, has, within the last forty years, practically eliminated hand loading. Today, in these operations the power shovel is just as necessary as the crushing plant. In any quarrying or open-pit mining operation the primary crusher, shovel, and transportation equipment should function as a team; therefore these three items of equipment, when possible, should be considered as complements of each other when making selections. This is especially important with respect to the crusher and the shovel.

### Shovel and Crusher Sizes

It has been customary for writers on this subject to tabulate a list of shovel dipper sizes and opposite these to list sizes of gyratory and jaw crushers that are considered to be suitable for operating in conjunction with power shovels equipped with such sizes of dippers. This is a little like putting the cart before the horse. The procedure omits one very essential factor: the character of the material that is to be crushed. For example, most limestone deposits are stratified, the cleavage planes usually being roughly parallel, and ranging anywhere from horizontal to almost vertical.

Regardless of how these strata lie, their thickness not only has an important bearing upon the type and size of primary crusher that can be expected to handle the rock with a minimum amount of secondary shooting, or bridging and blocking, but it also has a bearing upon the maximum size of shovel dipper that is suited for use in conjunction with a certain size of primary crusher. This statement is particularly applicable to the gyratory crusher because of the shape of its receiving openings. Two or three different maximum dipper sizes may be indicated for any one size of gyratory, depending upon the maximum strata thickness. In the case of the jaw crusher, with its rectangular opening, maximum dipper width and maximum strata thickness are established simply by the opening dimensions, and one maximum size dipper applies for each machine.

Table I takes both dipper width and strata thickness into consideration. Opposite each listed size of gyratory crusher is tabulated the maximum advisable size of dipper, in cubic yards, for the different strata thicknesses—up to the thickest ledge for which each crusher is suitable; that is, which it can be expected to handle with a minimum amount of secondary blasting. Crushers up to and including the 42-in. machine are listed with both straight and non-choking concaves. Six sizes of jaw crushers are listed, the dipper sizes for each having been chosen as outlined in the preceding paragraph.

These dipper selections are of course predicated upon the assumption that the dipper is expected to act as a a measuring stick for the crusher, which necessarily presupposes that all rock will be passed through the dipper—a procedure that

**Table I. Suggested maximum sizes of shovel dippers (in cu. yd.) for use in conjunction with various sizes of primary crushers, and for different thicknesses of rock strata**

| Gyratory crushers Size and fittings | Maximum thickness of strata in quarry in inches | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 12 | 18 | 24 | 30 | 36 | 42 | 48 | or more |
| 20-in. straight concaves | 1½ | 1¼ | | | | | | |
| 20-in. non-choking concaves | 1¼ | | | | | | | |
| 30-in. straight concaves | | 2½ | 1¾ | | | | | |
| 30-in. non-choking concaves | 2½ | 1½ | | | | | | |
| 36-in. straight concaves | | 4½ | 2½ | 1½ | | | | |
| 36-in. non-choking concaves | | 3 | 2 | | | | | |
| 42-in. straight concaves | | | 4½ | 3 | 1½ | | | |
| 42-in. non-choking concaves | | 4½ | 4 | 2½ | | | | |
| 50-in. straight concaves | | | | 4½ | 3 | 2½ | | |
| 54-in. straight concaves | | | | | 4½ | 3 | | |
| 60-in. straight concaves | | | | | | 4½ | 3 | |
| Jaw crushers Straight jaw plates | | | | | | | | |
| 42 x 30 in. | | | 1½ | | | | | |
| 42 x 40 in. | | | | 1½ | | | | |
| 48 x 36 in. | | | | 2 | | | | |
| 60 x 48 in. | | | | | 2½ | | | |
| 84 x 60 in. | | | | | | | 4½ | |
| 84 x 66 in. | | | | | | | 4½ | |

*Allis-Chalmers Manufacturing Co., Los Angeles, Calif., district office.

is rarely followed completely in any quarry operation. The experienced shovel runner soon learns how to judge the rock he is loading, with respect to the size and shape of the receiving opening it must enter, and a certain amount of "shuffling off of the dipper teeth" goes on in most quarries.

Admittedly no tabulation of this sort can substitute for actual experience with any particular rock or ore deposit. Some deposits which are of monolithic structure, and hence might be expected to shoot out in massive form, are readily shattered into workable sizes in the primary blasting operation; on the other hand, some stratified rocks shoot out in large slabs, which require either a large primary receiving opening, or a considerable amount of secondary shooting, or both. For those cases where no operational data are available to point the way, the table will serve as a guide that is believed to be on the safe side.

No particular problem exists in the matching of primary crusher and dipper size in the average gravel pit operation. The primary crusher is chosen on the basis of capacity (usually arrived at by estimating as closely as possible the percentage of boulders in the deposit), and receiving opening (as large as is consistent with the size of the operation), which may or may not involve crushing all of the boulders encountered in the bed of material. Quite frequently, in small or medium gravel operations, the larger boulders are cast aside and left in the pit.

The question of first cost of the crusher versus continued cost of disposing of oversize boulders is one that each gravel pit operator must settle to his own satisfaction. Most gravel pit operations involving the handling of large boulders incorporate some form of grizzly ahead of the primary crusher to "stop out" any boulders that are too large to enter the receiving opening. Therefore, the shovel dipper can generally be selected on the basis of required capacity. If the boulders are extremely large, and the plant capacity is high enough to justify the installation of a large primary crusher, the grizzly may be dispensed with, and the shovel dipper matched to the crusher receiving opening in the same manner as for the quarry.

## Transportation and Feeding

The size and type of transportation equipment in the quarry, pit, or mine should be coordinated with the primary crusher and with the proposed method of feeding this machine. It is not our purpose to discuss the selection of quarry equipment, other than to point out the ways in which different types and sizes of transportation equipment may affect the operation at the primary crusher house. It is difficult to deal with this subject in precise terms, because the factors involved are so variable, but a few general statements about what is, and what is not, considered to be sound practice may serve to point in the right direction, even if they do not give the exact distance.

Except for those rare cases where the size of the primary crusher receiving opening is greatly in excess of the size of the largest pieces of rock to be fed to it, the amount of material dumped into it at one time should not be much more than to fill the crushing chamber; otherwise, if blocking or bridging occurs, the time consumed in clearing the receiving opening is bound to be excessive. Therefore, if quarry cars of the quick-dumping type are to be used, their size should be selected with a view to preventing such a condition. For the average quarry operation the following table will serve as an approximate guide in establishing the maximum size of quick-dumping car that should be used to feed different sizes of gyratory crushers:

| *Crusher size* | *Car capacity* |
|---|---|
| 20 in. | 4-5 tons |
| 30 in. | 6-8 tons |
| 36 in. | 8-10 tons |
| 42 in. | 8-10 tons |
| 50 in. | 10-12 tons |
| 54 in. | 12-15 tons |
| 60 in. | 15-20 tons |

If there are only occasional pieces in the feed that exceed about one-half the smallest dimension of the crusher receiving opening, these car sizes may be increased as much as 25 percent. They may of course be exceeded considerably in mining operations where there is a high percentage of undersize which is grizzlied out ahead of the crusher.

Generally speaking, jaw crushers should not be fed from quick-dumping cars unless the receiving opening is large enough to virtually eliminate any danger of bridging. Because the receiving opening of this type of crusher is relatively narrow, it is almost always necessary to use a flared hopper above it to receive the feed from the car or truck—the hopper may be two or three times as long as the receiving opening is wide. This means that the material must converge as it flows or falls toward the receiving opening, and this confluence is a natural invitation to bridging if a large amount of rock is dumped quickly into the hopper.

Controlled-dumping, used in conjunction with side-hinged cars and incorporated in all modern quarry trucks, permits the use of larger equipment. While it does not entirely eliminate bridging, it materially lessens the likelihood of its occurrence by the simple method of holding back part of the load until the crusher has a chance to clear itself of the other part.

Controlled-dumping works out well with any type of primary crusher. While it does not provide absolute control of feed regulation, it is, next to the mechanical feeder, the best means of regulation for coarse material such as quarry-run or mine-run rock—certainly far superior to the quick-dumping car in this respect. It has one disadvantage: the time required to dump a load in two or more portions ties up the transportation equipment while the crusher is disposing of a considerable part of the original load. This tie-up is of no particular moment if the equipment consists of cars that are handled in trains of several units; for such operations the time-difference between quick- and controlled-dumping is negligible. On the other hand, if trucks are used, the aggregate idle time over an entire shift may add up to as much in the crusher house as it does at the shovel. Gyratory crushers, because of the greater volumes of their crushing chambers and their higher capacities, will usually function with less time-loss on this score than will comparable sizes of jaw crushers.

Car, skip, or truck bodies used for dumping directly into crushers of the jaw or single sledging roll types should be as short as is consistent with required capacity because of the relatively narrow receiving openings of these types. This will help to cut down congestion of material in the hopper above the crushing chamber, a tendency which we have mentioned in a preceding paragraph. Another point in favor of the short body is the saving in headroom between receiving opening and dump level. Somewhat longer bodies are permissible for gyratory crushers of comparable sizes because of the greater area and length of the receiving openings.

## Feeders for Crushers

The ideal feeding arrangement for jaw crushers of any size is the mechanical feeder. This device, which has been developed in several forms, provides regulation as smooth as is possible to achieve in the handling of coarse materials; it permits instant shut-off of the flow of feed when blockades occur; it allows quick dumping of cars or trucks; and it delivers the feed to the crusher in a ribbon, the width of which can be adapted to the width of the receiving opening. For those installations employing grizzlies ahead of the crusher the advantage of the uniform flow is obvious; very short grizzlies will handle the coarse separation ordinarily required at this point, whereas grizzlies three or four times as long will generally be required if large amounts of material are dumped over them in a "one-shot" dose.

The mechanical feeder is of course an excellent device for feeding any



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type of primary crusher. Some type of feeder is used for such service in almost every gravel plant, at some point in the system—at the shovel, under the surge pile, or immediately ahead of the crusher, depending upon the methods utilized in excavating and transporting the pit-run gravel to the crushing plant. Feeders of the reciprocating plate type, steel apron type, and electromagnetic type are all popular for this duty. These types are also extensively used in conjunction with underground mining operations.

For heavy-duty quarry or open-pit mining operations the heavy-duty steel apron feeder is the most practical type. It can be made in any length to fit in with any type and size of transportation equipment and crusher house arrangement. It has been developed in sizes to suit any size of primary crusher, and of proportions suitable for handling any rock that the largest sizes of crushers will take.

Because of their heavy construction these heavy-duty apron feeders add materially to the initial cost of the primary crusher installation; naturally they add something to the overall cost of maintenance and power. The question of whether or not this added expense is justified will depend upon conditions surrounding each particular installation. If the crusher has an ample margin of capacity over and above the plant requirements, as is often the case when it has been chosen from the standpoint of an amply large receiving opening, occasional delays due to bridging are not apt to be serious; and the shovel and transportation equipment, chosen to work with such a crusher, are usually capable of making up for any time-losses thus incurred. For such operations it is questionable if the cost of the heavy feeder is justified. On the other hand, if the operation demands full-time, or nearly full-time, crushing to meet the plant requirements, the case for the feeder is clear cut from every standpoint, at least so far as the jaw crusher is concerned. For reasons which have been discussed, their use with gyratory crushers, especially the larger sizes, is debatable, unless, as is done in some large mining operations, the designer wishes to establish a surge or stockpile ahead of the primary crusher.

To revert to the gravel and underground mining operations, now that vibrating screens of extra-heavy construction have been developed to handle large pieces of rock over their top deck, it is very probable that such screens will come to be used more and more as combination scalpers and feeders—a service for which they are admirably adapted. The advantage of being able to make a clean cut and definitely sized separation at this point will be of great value in many cases; and the high efficiency of the vibrating screen, as compared to the stationary bar grizzly, will appeal to those operators who want no undersize material in the feed to the primary crusher. The same idea in modified form, using smaller and lighter screens, can be applied to operations involving small rock and small crushers.

### Drilling and Blasting

It is not within the province of this work to discuss methods of drilling and blasting of rock or ore other than to point out that the system employed at any particular operation may have some influence upon the choice of the primary crusher, specifically, upon the size of the receiving opening. The foregoing discussion of primary crusher selection, for open-pit workings, has been predicated upon normal present-day practice in primary drilling and blasting, which in most cases involves either the familiar well drill or some system of tunnel shooting.

Admittedly, any kind of rock, regardless of physical structure or geological formation, can be blasted to suit any size of crusher receiving opening. During the early years of the application of power shovels to quarry operations in this country it was not uncommon to see crushers as small as the No. 6 (12-in. receiving opening) operating in conjunction with shovels of 1½ or 2 cu. yd. dipper capacity; crushers such as the No. 8 (18 in.) and No. 9 (21 in.) were considered adequate for practically any primary crushing application within the ranges of their capacities.

Such operations almost invariably called for extensive secondary shooting in the quarry, even where the old tripod drills were employed for the primary drilling operation. They also necessitated the employment of from two to four men at the crusher to hand-feed the rock to the machine. Thus the labor and explosives costs were, in the light of present day practice, quite high, and with present day labor costs the expense of such a system of quarrying and crushing would be prohibitive.

Practically any open-pit operation will, over a period of years, justify the installation of a primary crusher of large enough proportions to permit carrying on the quarry operation with no more than a reasonable amount of secondary shooting. Quarrymen know that much can be done to minimize secondary shooting by adjusting primary drilling and blasting methods to suit the nature of the rock, but such expedients always involve an addition to the unit cost of operation—an expense that goes on and on through the life of the operation. The cost of providing an adequate receiving opening is a one-time expenditure, one that pays dividends over and over through the years.

The same argument may be carried on into the crusher house. If it costs $2000 per year to maintain a man on the feed platform, simple arithmetic indicates that the maintenance of this man for a period of twenty years (a reasonable life-expectation for a crusher) will cost the operator some $40,000. Usually it will be found that the difference in first cost, between an inadequate and an adequate crusher, will be considerably less than this figure. The well designed modern primary crusher house should run with one man on the feed platform, with possibly a second man available on call to assist in emergencies.

*(To be continued)*

## Gypsum Production

DOMESTIC MINE PRODUCTION of crude gypsum during the second quarter of 1952 was 2,067,003 short tons, as reported to the Bureau of Mines. This was a decrease of 10 percent compared with the output in the second quarter of 1951. Production of calcined gypsum was 13 percent less than in the same period last year. All gypsum products, except sanded plasters and dental and orthopedic plasters, showed declines from the second quarter of 1951. Portland cement retarder declined 15 percent and agricultural gypsum 10 percent. Of the prefabricated products, lath production decreased 21 percent, while the output of wallboard and laminated board showed a 6 percent drop.

The second-quarter production of gypsum and gypsum products, according to classification, was listed by the Bureau of Mines as follows:

| | Short Tons | |
|---|---|---|
| | 1952 | 1951 |
| Crude gypsum: | | |
| Mined | 2,067,003 | 2,305,307 |
| Imported | 733,551 | 664,409 |
| Calcined gypsum produced | 1,719,595 | 1,981,018 |
| Gypsum products sold or used: | | |
| Uncalcined uses: | | |
| Portland cement retarder | 407,855 | 481,748 |
| Agricultural gypsum | 146,769 | 163,107 |
| Fillers and unclassified | 5,342 | 11,215 |
| Industrial uses: | | |
| Plate glass and terra-cotta plasters | 11,233 | 14,765 |
| Pottery plasters | 10,560 | 11,558 |
| Dental and orthopedic plasters | 2,721 | 2,350 |
| Other industrial uses | 36,912 | 42,508 |
| Building uses: | | |
| Plasters: | | |
| Base-coat | 494,822 | 591,646 |
| Sanded | 37,713 | 28,112 |
| To mixing plants | 2,488 | 4,216 |
| Gauging and molding | 45,762 | 52,788 |
| Prepared finishes | 3,749 | 5,690 |
| Other building plasters | 53,347 | 63,804 |
| Keene's cement | 14,045 | 15,053 |
| Lath | 589,300 | 745,224 |
| Wallboard and laminated board* | 799,409 | 846,540 |
| Sheathing* | 31,235 | 31,354 |
| Tile* | 6,670 | 10,710 |

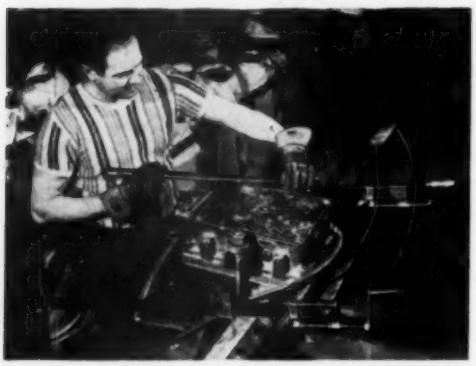
*M sq. ft.

## Buys Gravel Pit

A. T. BARNHARDT, Gates, Ore., has purchased the Jungwirth Sand and Gravel Co. pit at Mill City, Ore. Previously he had purchased the ready-mixed concrete company which serves the area.

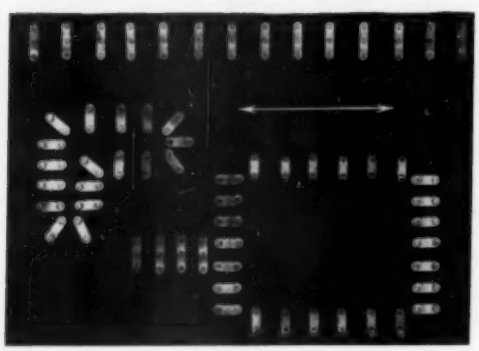
# TIPS ON REPAIRING CONVEYOR BELTS

Typical belt repair kit, containing emery cloth, sharpening stone, cobbler's knives, rubber cement, sheet of patching rubber, cotton duck impregnated with rubber, belt fasteners, waste for cleaning, fabric pulling pliers and roller



Portable vulcanizer. Top half is bolted to bottom with belt in between. Old belt in front merely supports part of vulcanizer not in contact with repaired spot

Portable vulcanizer in use, vulcanizing small repair near belt edge. Bottom half of vulcanizer is placed under belt



Rip plates used to repair longitudinal tear (top); all others shown are fasteners except four rip plates to left of large square patch

IN ORDER TO GET the maximum service life out of conveyor belting, industrial users should take particular care to repair all belt damage as soon as it is discovered.

Belt fabric exposed to weather will absorb moisture if the protective cover becomes damaged, and may even become soaked. In warm weather, this condition leads to mildew and rot; in winter, ice crystals may gnaw at the fabric from within as the belt flexes. Thus, immediate repairs not only prevent the spread of damage, with its threat of premature failure, but also keep out the water which is the natural enemy of any conveyor belt.

The simple tools and procedures outlined here by Newell Perry, belting engineer of Thermoid Company, will help the maintenance man to give belting proper attention. An adequate repair kit includes sharp cobbler's knives and a stone to keep them sharp; a supply of emery cloth, rubber cement, inner tube patching rubber, rip plates and standard belt fasteners and accessories, together with rags and gasoline for cleaning. As each belt is installed, remnants shoud be kept, because they will prove useful in subsequent repairs.

To mend long and deep cuts which go through to the fabric, Perry recommended, open the cut, clean out all dirt, and cement the cut closed, allowing the cement to dry thoroughly before the belt is restored to service. Where bits of torn cover leave exposed spots with only slight damage to the fabric, remove the loose ears of cover stock by carefully cutting a curved and bevel-edged area around the spot; then sand the edges, apply cement, allow it to dry, apply tire patching rubber and finally skive the patch flush with the belt cover.

Where gouges have penetrated the belt, or longitudinal rips have occurred, these points must be cleaned, sanded, cemented and reinforced with rip plates at three-inch intervals. Transverse rips require similar treatment with standard belt fasteners instead of rip plates. Use rip plates on longitudinal rips only, and standard fasteners on transverse rips only. When holes in the belting do not permit the simple use of rip plates and fasteners, cut out the hole into the smallest possible rectangle with its sides parallel to and at right angles to the belt edges. Then, from belting remnants, cut an exact fit for the hole and insert the piece, fastening it with belt fasteners all around the patch. Cement all edges thoroughly. Where it is necessary to prevent seepage of fines through belt repairs, remove one ply of fabric from a belt remnant and place it under the fasteners and rip plates.

Vulcanized patches are superior to those described above, but require the addition to the kit of a portable vulcanizer, rubberized fabric, tie gum, cover stock, a one-ply knife and fabric pliers. In preparing a vulcanized patch, work down into the damaged belt as far as necessary by removing progressively smaller blocks of fabric with each successive ply. Clean, roughen and cement the cavity, neatly fit in blocks of new fabric and finally apply the uncured cover. Skive the edges of the patch flush, and vulcanize. Such patches cannot be made successfully unless the belt is dry, because the presence of moisture will permit the development of internal steam blisters.



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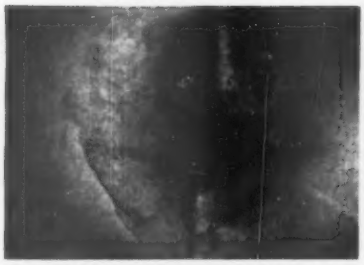
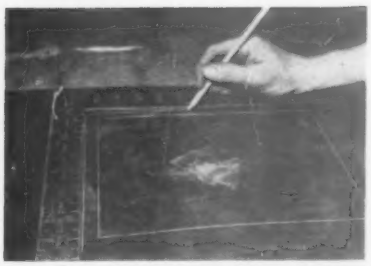
A serious puncture made by a rock is discovered by maintenance crew



Rock is withdrawn and entire section of belt is taken to belt repair shop

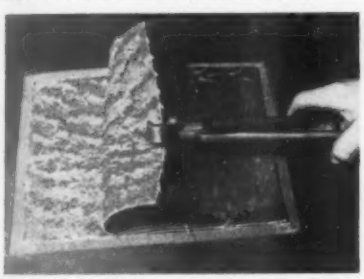


Section of belt to be removed is marked out on top cover with a square; last section should encompass damaged area

Thin strip about ½ in. wide is marked out inside large square, cut through cover to first layer of fabric with sharp cobbler's knife

The thin strip is pulled off

Using the edge of the square of cover inside the strip as a guide, the first layer or ply of fabric is cut through



Belt pulling pliers are used to pull off the first ply with adhering cover

Remove progressively smaller blocks of fabric with each successive ply. Square to be cut should be marked out indenting about ½ in.

Bottom cover is last removed. Note that damaged area has been removed, and all lengthwise cuts are parallel to edges

Belt is turned over and the bottom cover is pulled off in a strip about 2 in. wide

Belt fabric exposed must be completely dry, then clean and roughen cavity. Rubber cement is applied

After cement has been applied, squares of rubber impregnated fabric are cut to fit each layer until cavity has been filled

Piece of uncured rubber of the same thickness and composition as original cover is cemented in, rolled flush, then trimmed

Patched belt is placed in vulcanizer

Belt is ready to put back into service

# BUILDING COMMUNITY GOOD WILL

**American Aggregates Corp. continues its program of civic responsibility with the presentation of a landscaped park to the city of Greenville**

DURING THE PAST few years there has been an increasing number of suits, petitions and complaints against the operation of sand and gravel plants in or near residential areas, many of which have been reported in ROCK PRODUCTS from time to time to show the growing trend. Zoning restrictions prevent the opening of many new plants where sand and gravel deposits would permit profitable operation, and also limit or prevent the expansion of many existing plants.

Many communities, mistakenly or rightfully, believe that gravel "pits" can only be a detriment to their community, creating dangerous hazards for their children and detracting from the scenic landscape. This growing public opinion could have a tremendous impact on the future of the sand and gravel industry. Too often these fears are justified, but they needn't be. A shining example of how community and industry *can* work together to the profitable enjoyment of both has been amply demonstrated by American Aggregates Corp., Greenville, Ohio. This company's far-sightedness and sense of civic pride and duty has promoted a good community relationship which could well be a model for the entire industry. Good public relations could very well mean the preservation of the industry.

American Aggregates Corp. has made it a practice to rehabilitate all worked-properties at its various sites, the type of reclamation and development depending on local conditions. Most of these developments have been set up as non-profit, but self-supporting, organizations, owned by the company, but operated for the benefit of the communities in which they are located. The "unsightly pits" and surrounding areas have been transformed into beautiful lakes, parks and recreational areas. Once a project has been started, the company has found the townspeople enthusiastic, many of them joining in a cooperative effort to assist in the project. Organizations, firms and individuals donate time, labor and materials until it becomes more or less a community project under American Aggregates' leadership.

American Aggregates' latest community project is the Greenville Public Square Parkway, an attractively landscaped development, financed by the company at a cost of $50,000. Impressive dedication ceremonies, held on the evening of October 10, were participated in by a number of distinguished people, including Ohio's governor, Frank J. Lausche; George Nye, lieutenant governor; Lowell Thomas, famous news commentator; Judge Charles B. Zimmerman of the Ohio Supreme Court; and U.S. Congressman William M. McCulloch.

The parkway was officially turned over to the city by William Edward Hole, president of American Aggregates, who stated that the work was the result of a "common zeal for a better town." He also praised Fred D. Coppock, chairman of the board, who was largely responsible for the development and who had personally designed the layout of the Square and the fountain which graces its center. Following is the text of Mr. Hole's speech:

"I speak to you on behalf of all employes and shareholders of American Aggregates Corp.

"This impressive ceremony dedicating our Public Square marks the realization of long-time hopes and plans. To those who suffer the pangs of nostalgia for old landmarks and for things that have passed, we offer, in modest recompense, this new Greenville 'common' with its modern utility, classic symmetry and clean beauty.

"Grateful are we that a kindly Providence has blessed us with the means to make this contribution to civic improvement. All of us share the common zeal for an ever-improving home town. In our quest for material betterment, we must not, we dare not, be indifferent to the great moral plan of life. Civilization's best hope is a universal inclination to the spiritual prompting that man was born to serve.

"What you view here represents the cooperative service of many. For such high-minded community effort we express our undying gratitude.

"I daresay that the following remarks will prove embarrassing to the one man most responsible for the conception and prosecution of this Public Square project. I refer to Fred D. Coppock, founder and chief executive of our business enterprise. Not only did Mr. Coppock personally prepare the layout of the square itself, but he also designed the fountain which you behold and ingeniously contrived its intricate functioning. In person, he supervised the carrying on of the work to completion.

"We, who have toiled shoulder-to-shoulder with Mr. Coppock for more than a quarter of a century, know him as a man of high imagination, restless energy and uncommon ability, qualities high lighted by a deep and sincere humility. His good works are legion. He has given unstintingly of his substance and of his spirit to the improvement of every facet of our community life. May the blessings of abundant happiness and of good health ever attend him!

**Principal participants in dedication ceremonies, left to right: Edward Hole, Mayor Marion Perry, Fred Coppock, Lowell Thomas at microphone, Judge Vernon Marchal, master of ceremonies, and Ohio's Governor Frank Lausche**



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"Mayor Perry, I bring to you no muniment of title, no evidence of ownership of things tangible. On behalf of our employes and shareholders, I do present to our fellow citizens the accomplished fact of a modernized and beautified Public Square, symbolizing, as it does, our corporation's devotion to the ideal of public service for the common good."

The new Square was officially accepted for the city by Mayor Marion Perry, at which time the following resolution, passed by the City Council, was read:

"A resolution declaring an expression of gratitude to the American Aggregates Corp., and to Mr. Fred D. Coppock for their community service in improving and enhancing the Public Square of the City.

"Whereas, it is our persuasion that community service is one of the profoundest expressions of individual American life; and

"Whereas, this Council and the citizens of this city have witnessed and have benefited from a product of that singular expression in the improvement and beautification of the Public Square of the City by the American Aggregates Corp.; and

"Whereas, Mr. Fred D. Coppock, of the American Aggregates Corp., our neighbor and fellow-citizen, was the impelling means in the completion of this improvement, and has expended many hours of ardor and care in the execution of his vision, now accomplished, now, therefore,

"Be it resolved by the Council of the City of Greenville, Ohio,

Section 1: That the gratitude of the people of Greenville be expressed to the American Aggregates Corp. and to Mr. Fred D. Coppock through us, their chosen agents of government, for their deeply appreciated contribution to us in their enhancement of the Public Square and their dedication of it to the benefit of the City.

Section 2: That the clerk of the Council is hereby directed to properly authenticate copies of this resolution and deliver a copy to Mr. William Edward Hole, president of American Aggregates Corp., and a copy to Mr. Fred D. Coppock."

Another feature of the program was the Greenville Chamber of Commerce's presentation to Mr. Coppock of an album of pictures, tracing the development of the parkway from start to finish.

Lowell Thomas delivered his nightly C.B.S. newscast from a special platform erected for the dedication ceremony. In his broadcast, Mr. Thomas informed a nation-wide audience that he was dropping Stalin, Truman and Eisenhower from his script to tell the country about Greenville and its people and, during his talk, he extolled Mr. Coppock as a "No. 1 Citizen."

Mr. Coppock, who was the guest of honor at the dedicatory exercises, also spoke briefly to the approximately 2500 persons attending the ceremonies. With sincere but undue modesty, he stated that although he and the company deeply appreciated all that had been said, he felt that too much credit had been given to him personally and to American Aggregates Corp. He felt that others deserved the credit for having made the improvements, as a job like that could not be done without the assistance of a lot of willing and capable workers, of which there had been many. He read a list of those who had contributed considerable time, effort and needed materials, including the State Highway Department which had provided information regarding accommodations for traffic handling and plans and specifications for the paving; the city engineer who had donated his services for the necessary detailed engineering; all the city services including the council, officials, police, fire department, service and safety directors, and the water department; firms which had contributed concrete, lumber and other needed materials and equipment; and also many individuals who had donated their services so willingly and tirelessly.

With the community praising Mr. Coppock and the company, and vice versa, each wishing to give the other the credit, there can be little doubt as to the good public relations established in the Greenville community.

If companies can once convince communities that they have no intentions of ruthlessly exploiting land for sand and gravel production and then walking out when commercial operations are completed, but, rather, will restore the property even beyond its original beauty and community usefulness, then they are not likely to be bombarded with objections, injunctions and zoning restrictions.

## Azbe Foreign Activities

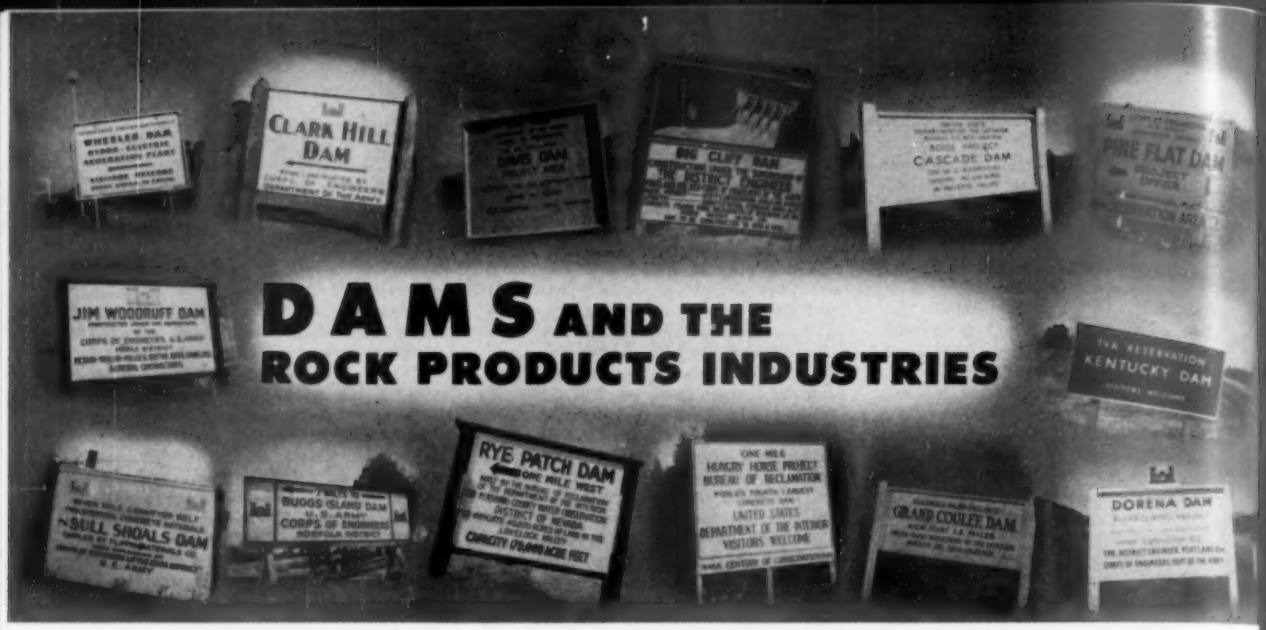
INDUSTRIAS REUNIDAS F. MATARAZZO, Sao Paulo, Brazil, under the management of Count Francisco F. Matarazzo, Jr., leading Latin American industrialist, recently placed a new vertical lime kiln plant into operation. The plant, consisting of kilns of up to 100-ton capacities and embracing some new special features, was designed by Azbe Corp., St. Louis, Mo.

Other recent foreign activities of Azbe Corp. include completion of the design for conversion of the large mixed-feed kiln of Imperial Chemical Industries of Australia to the Azbe type of alternate producer gas- and oil-firing systems, and the designing of a new plant for Taiwan Alkali Co., Ltd., of Formosa. This plant is being planned for production of maximum output of pebble lime from an extremely friable material. Azbe Corp. has also received a 4-year contract to develop the plant of Cal Malagueno in Cordoba, Argentina.

## Billions for Construction

ACCORDING to *Engineering News-Record*, Congress has voted funds for construction as follows:

| Who Gets It | Appropriations Fiscal 1953 | Appropriations Fiscal 1952 |
|---|---|---|
| Military public works | $2,146,764,840 | $4,183,920,700 |
| Air Force | 1,200,000,000 | 2,258,500,000 |
| Army | 585,510,000 | 1,073,763,700 |
| Navy | 361,254,840 | 851,657,000 |
| Army civil functions | 584,061,600 | 581,217,713 |
| Atomic Energy Commission | 2,800,000 | 1,604,997,750 |
| Bureau of Reclamation | 177,797,991 | 208,052,725 |
| Roads | 401,770,000 | 461,995,000 |
| Federal grants to highways | 325,000,000 | 394,500,000 |
| National parks & parkways | 14,770,000 | 11,370,000 |
| Forest roads (Bur. of Pub. Rds.) | 18,000,000 | 21,000,000 |
| Forest roads (Forest Service) | 11,000,000 | 13,000,000 |
| Access roads | 15,000,000 | 1,500,000 |
| American highway | 1,000,000 | 3,000,000 |
| Alaska roads | 17,000,000 | 20,000,000 |
| Alaska Tongass Highway | NONE | 3,500,000 |
| Elimination of grade crossings | NONE | 3,000,000 |
| Public lands highways | NONE | 1,125,000 |
| Defense housing | 50,000,000 | 37,500,000 |
| Community facilities | 8,000,000 | 28,625,000 |
| Housing & Home Finance Agency | NONE | 20,625,000 |
| Federal Security Agency | 8,000,000 | 8,000,000 |
| Alaska housing | 4,000,000 | 5,000,000 |
| Tennessee Valley Authority | 336,000,000 | 231,905,791 |
| Federal grants to airports | 19,281,154 | 28,700,000 |
| Federal grants to hospitals | 134,700,000 | 182,500,000 |
| Federal grants to schools | 135,000,000 | 75,000,000 |
| Veterans Administration | 42,475,000 | 27,505,080 |
| Bureau of Indian Affairs | 17,500,000 | 10,575,000 |
| Power distribution agencies | 81,632,900 | 711,935,000 |
| Bonneville Power Administration | 66,523,400 | 67,500,000 |
| Southwestern Power Administration | 4,150,000 | 3,375,000 |
| Southeastern Power Administration | 959,500 | 318,500 |
| Alaska Railroad | 3,906,000 | 2,000,000 |
| Alaska Public Works | 13,208,200 | 7,000,000 |
| National Advisory Committee for Aeronautics | 17,700,000 | 18,350,000 |
| Bureau of Mines | 3,600,000 | 1,587,412 |
| Public Health Service, constr. of research facilities | NONE | 17,685,540 |
| International Boundary and Water Commission | 11,176,000 | 12,000,000 |
| Bureau of Standards, Constr. of Laboratories | NONE | 3,800,000 |
| General Services Administration | 14,000,000 | 4,400,000 |
| Totals | $6,833,515,425 | $13,291,986,911 |




# DAMS AND THE ROCK PRODUCTS INDUSTRIES

By WALTER B. LENHART

THE DAM BUILDING program in the United States is one of the most controversial subjects of our economy. It has become a political issue, albeit over-emphasized, with a choosing of sides, one for public projects, the other opposed to them. Yet the dam building program in the United States is not likely to abate or stop, regardless of the political party in power.

The dams in the nation are important outlets for our crushed stone, sand and gravel and portland cement. The design of the concrete going into a dam, the physical characteristics of the concrete, its durability and the methods of placing the concrete are of equal interest to the rock products and ready-mixed concrete industries. The processing of sand and gravel at the larger concrete structures often involves new ideas and new design techniques, setting a pattern which is frequently followed by other plant builders.

The construction of municipally owned dams for electric power, or for domestic water supply, is not a new venture. Participation of branches of the federal government in dam building is relatively new, however.

There are certain basic questions which need to be answered concerning dam construction: Are they needed? Are they the answer to flood control? Do they adequately help prevent erosion? Who should build them? Is electric power the principal goal of the builders? Will the dams fill with silt? Are they stable and enduring structures? Will a modern concrete dam survive a major earthquake such as recently hit the desert areas of California? Are big dams better than little dams? What happens when a dam fails? Is the impounded water being put to its fullest and proper use? Is irrigation a fundamental necessity? In event of an aerial attack, can a modern dam withstand an aerial torpedo assault? Are the construction costs too high both in dollars and in the consumption of our physical resources for the results obtained? Can the federal government develop power more cheaply than private enterprise? Is the loss in taxes of a government-built project so great that it offsets the savings in power to the consumer? Who should operate a dam? How can one buy power from a dam? Who owns the water behind the dam? Who actually owns the electric generators in the power plants? These and many more questions are involved.

We have visited the important dams in the United States and studied them in detail, and have superficially inspected several hundred more. The Industrial Arts Index, incidentally, indicates that ROCK PRODUCTS has published more comprehensive articles on dams and their material production facilities than most construction magazines. The production of aggregates going into any dam, the design of the concrete and the equipment necessary to produce that concrete are all essentially the same as that required by any modern ready-mixed concrete plant. Dam builders buy the majority of the material they use from commercial aggregate producers. When the aggregate is produced on the job an established commercial stone producer is very often one of the member companies making up the prime contractor. For example, Six Companies, Inc., builder of Hoover dam, was headed by Henry J. Kaiser. The latter's company also owns one of the largest portland cement plants in the United States, as well as lime, sand and gravel, crushed dolomite, ready-mixed concrete and gypsum and wallboard plants, and more recently a perlite operation. At Mt. Morris dam in New York state, General Crushed Stone Co., a large aggregate producer, quarried the rock and shipped it to the dam site for processing by the contracting company. One important member of that group of contractors was The Arundel Corp., Baltimore, Md., producer of sand and gravel, crushed trap rock, agstone and ready-mixed concrete.

One of the newest dams, now in early construction stages, is Chief Joseph dam on the Columbia river below Grand Coulee dam. The $221,000,000 project is in the hands of Chief Joseph Builders, a group of contractors which includes The Arundel Corp. again, and American Pipe & Construction Co. of Los Angeles, Calif., well known concrete pipe manufacturer.

The tonnage of aggregate supplied to a dam by the contractor is an insignificant figure. The moment a contractor sells his products to any buyers, he can rightly be called a commercial producer. Millions of tons of riprap and jetty stone are used at dams, whether the body of the structure is concrete or earth fill, and in the several hundred construction sites we have inspected, this type of stone was invariably supplied by an established commercial producer. Rock products producers therefore have a vital stake in the dams of the United States.

A far greater stake is in the later economic development of the area surrounding the dam. Roads, highways, bridges, homes, hotels and business establishments are required with the movement of population to a newly opened area. Hence, one can see that the construction of a big dam, or a series of dams, opens new outlets for the materials our industries have to sell. For example, in the Northwest, at one irrigation project served by a large dam, an estimated 15,000 miles of concrete pipe for irrigation and drainage purposes, and hundreds of miles of huge concrete-lined canals, may be used.

Some dam construction jobs involve several million tons of aggregates, whose specifications are new and strict. If the tonnage is large, a new



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plant is usually built. Most of the newest wrinkles in aggregate processing are incorporated in its design. Recovery of the fine sand, close gradation of the concrete sand, cooling of the coarse aggregates, manufacture of sand by the use of rod and ball mills, cooling of sand by various methods, and many other processes can be found. When a new plant is built involving several new innovations it generally utilizes new equipment. Thus we not only have an interest in the economic aspects of dam construction but also in the technological developments.

The construction of a dam starts from a local need. Flood control, soil conservation and irrigation are the main purposes. The development of electric power is essentially secondary, though it is the tangible asset. The sale of that power makes the project self-liquidating and financially sound.

Hoover dam on the Colorado river, originally known as Boulder dam, provides an interesting case history—and the start of an epoch. Surveying, core drilling, and other reconnaissance work was under way years before the money was appropriated in 1928 to build it. The opposition to its construction was as powerful as could be mustered at the time. Fortunately for the dam builders, the allocation of power from Hoover dam for the Metropolitan Water District of California was so large that some felt there would be little electric power left to compete with that developed by private companies in California. The measure passed. The depression and the public works programs of the early 30's seemed to sweep away the remaining barriers to construction. Today the tide has turned and new dam projects arise each year.

About the only local people to voice opposition to a local project are those whose land will be innundated by the backed-up waters of the proposed dam. The proponents of dams point out that this land is not confiscated, that it is bought and paid for, usually at a premium. More acres of good land are lost each decade by river erosion and flood waters than will be buried below the impounded waters. Dam sites are selected with a keen eye to this, and if two or more sites are available the one covering the least fertile land is usually selected. Similarly, the defenders of dam building give instances showing that the location of a proposed dam has been moved so that national parks or national monuments would not be jeopardized.

**Not all dams are earth fill or concrete construction. This is Roosevelt dam in Arizona, a masonry structure**

Much of the current opposition to dam building emanates from those who are concerned with siltation. The layman can easily comprehend that in time a dam's backwaters will become full of waterborne debris. The opponents of dam building say that certain large dams on the Missouri river will be full of silt some 20 years after they are built. Engineers, however, estimate that this will take 1000 to 1400 years. Propcnents point out that for the past few decades the flow in miles per hour, in cubic feet per second, or acre feet per year, of our important rivers has been accurately measured and tabulated. Not only is the flow a matter of record, but the silt load per cubic foot of water has been measured. From these data can be determined how long it will take to fill up a reservoir once the flow of the river has stopped and the silt load has dropped. Studies on Hoover dam, for example, where impartial engineering groups have been employed to measure the silt deposited in Lake Meade behind it, have shown that earlier calculations were substantially correct.

There are two tangible sources of income from a dam. One is through the sale of water for irrigation below the dam; the other is through the sale of electric power. The government sets up the unit cost of the water to the farmer, and the unit cost of the electric power to the consumer on the basis that the cost of the dam should be returned to the government in 50 years. Some say this income is possibly returned to the government, but is not returned to the taxpayer. The taxpayer, it is said in reply, has received benefits from the structure through lower electric light bills, freedom from devastating floods, a more bountiful food supply, new recreation facilities and other intangibles.

The government did not assume major responsibility in dam building until 1902, the year the Bureau of Reclamation was established by Theodore Roosevelt. Thus there are no projects on which to base any conclusions about paying off the cost of a dam. Some dams, Elephant Butte on the Rio Grande, for example, are behind schedule financially. During the depression years of the early 30's the government was lenient with the hard pressed farmers and allowed some of their payments to lapse. The undertaking should be paid for long before the project is impaired by siltation, it is claimed.

The two large dam building organizations in the United States are the Bureau of Reclamation, Department of Interior, and the Corps of Engineers, U.S. Army. The Bureau of Reclamation is now 50 years old. Its field of operation is limited to the 17 western states. The Corps of Engineers is charged with maintaining our navigable rivers and harbors, and it is to control siltation and floods that dam construction has entered its province. Today we find the Corps building dams as a source of electric power for defense industries. Lately the Army Engineers have moved into the 17 western states and competed, project for project, with the Bureau of Reclamation. An Act of Congress often has to decide which is to be the builder of a certain project.

In some instances duplication of preliminary surveys has been made for the same project by the Bureau of Reclamation and the Corps of Engineers. Hell's Canyon dam, yet on paper, to be built on the Snake river, is given as an illustration of this duplication. This dam, if and when it is built, will be one of the nation's giants and the highest dam in the world. Competing as they do in a strictly technical sense, the taxpayer is more apt to get his full tax dollar's worth through competition and attention to details that might otherwise be sloughed over.

**Lahonton dam, near Reno, Nev., conserves water of the Truckee river for irrigation**

Grand Coulee dam on the Columbia river is a spectacular sight. It is the largest concrete structure in the world

On the Missouri river the Corps of Engineers is entrusted with the building of six more huge dams on the main stream, while the Bureau of Reclamation is planning almost a hundred more dams on the main tributaries. Some of these dams are quite large. The Soil Conservation Service is building thousands of small dams, mostly earth fill, in every little gulch and ravine. One object is to prevent the movement of silt. The claim is made that only little dams fill with silt. As an illustration Bonner's Ferry municipal power dam built on the Moyie river in northern Idaho is singled out. The first dam, a little one, is now full of silt and useless. A larger one was built above it. Because of its size it will not soon be full of silt.

Elephant Butte dam on the upper Rio Grande river was built in 1913-16, and is in its 36th year of usefulness in an area plagued with torrential cloudbursts. It is unaided by control dams upstream but the designers are not worried about silt. Plans are afoot, however, to build one or more dams upstream in the years ahead in order to provide the farmers in the rich Rio Grande Valley downstream with hundreds of years source of irrigation water. Electric power at Elephant Butte dam is not important.

Next we inspected Hoover dam and Lake Meade, the largest man-made body of water in the world. We wanted to see for ourselves what silt was doing to this great body of water and to the power that stems from it. We found that in the 16 years Lake Meade has existed, silt deposition has hardly started. These observations checked with scientific information on hand, which indicate that the dam would last for approximately 400 years. When the proposed dams to be built upstream are completed, they will receive most of the siltation, adding more centuries of life to Hoover dam and to Lake Meade.

There are to be found big dams on the Missouri: Ft. Peck, Garrison, Oahe, and Ft. Randall. The last three are now under construction. After inspecting them, we judged it would take at least 1000 years for them to silt up.

What if a dam does fill with silt? What happens then? At the site of Gavin's Point dam on the Missouri river near Yankton, S.D., can be seen land that is to be innundated by the backed-up waters of the dam. As the dam fills with silt the useless grazing land above it will be leveled. By allowing the stream bed to drop a few feet a great farming area will be born. If these dams silt up as rapidly as possible, Ft. Randall dam, well above Gavin's Point, could create some 118,400 acres of reasonably level ground, in a climate admirably suited for agriculture.

Proponents of dams emphasize flood control, soil conservation, gravity irrigation, and cheap electric power so that water can be pumped for irrigation purposes if required. The basis of these needs is food. Food, and the future food requirements of the nation, are important subjects. To grow food we must have water, water above ground level, and water below ground level.

If the population increases for the next 20 years at the same rate as for the past two decades, our acres of agricultural land will not supply us with enough food, or of sufficient quality to maintain present day standards. It takes about 1.3 acres of agricultural land to feed one person for a year, and we have available 1.7 acres now. By as early as 1970, only



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Prado dam on the Santa Ana river could be called the dam without any water; it is a flood control dam which would retain flash flood water from innundating citrus groves downstream

Much interest has been centered on the construction of Hungry Horse dam on the south fork of the Flathead river in Montana. Here is an early construction picture, showing the penstocks

18 years away, our population will have caught up with our available acres. Only six to eight percent of the world's total food supply is available for international distribution, and 20 to 40 years from now there may be none available to ship between countries. A basic need for dams is evident as well as vast conservation and irrigation projects associated with them.

Opponents of dams point to the great number of silos and storage bins that are strewn across the nation, silos that are full of wheat, corn, barley, oats, and other small grains. If the Commodity Credit Corporation had in storage a billion bushels of small grain, it would keep us alive for a time but if that billion bushels were transformed into pork chops, steaks, roasts, veal and other proteins it woud only add one pound per week per family for one year to our meat supply.

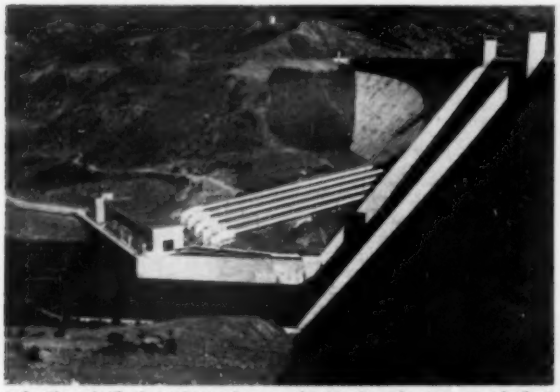
So there is the crux of the problem. Do we want steaks or don't we? Provision for them must be made now. It takes decades for a vast irrigation project to come to maturity. Imperial-Coachella Valley project in southern California was first conceived back in 1870. Now, in 1952, the project is finally nearing completion.

The dam builders are not content with the vast works that are now underway, such as the development of the Columbia river basin, the Colorado river plans, the Central Valley project in California, the upper Missouri river program and scores of other plans that are actually underway and which will take many years to complete. There is a proposal to bring water out of the Columbia river and send it down to California. A few years ago Congress appropriated money for a preliminary survey and later augmented the sum. According to reports, a site has been selected from which the water will be diverted. Just where in California the water will be used is one of those points to be determined as the survey proceeds. Probably the water would be dumped into the headwaters of the Sacramento river and later be picked up by canals and pumps until it reached the southern end of the San Joaquin Valley in the Fresno-Bakersfield area. There the land is flat, ideal-

Ross dam on the Skagit river in Washington is considered one of the best concrete structures in the country

Trash rack at Imperial dam near Yuma, Ariz. screens out waterborne debris; scraper travels along rack, removing debris and depositing it in rail car

The highest concrete dam in the world, Hoover dam on the Colorado river



**Left: Though Elephant Butte dam on the Rio Grande river was built (in 1913) improperly according to today's standards, it is still a serviceable structure. It was made of Cyclopean concrete. Right: More than 12,000,000 tons of aggregates were transported 10 miles on belt conveyors to build Shasta dam, on the upper Sacramento river in northern California**

ly located as regards climate, and water is needed. Some of the water from the Columbia conceivably might go through the Tehachapi mountains into the Mojave desert areas and into southern California, perhaps into the Colorado river. The Colorado is the backbone of the irrigation projects in Arizona and southern California and more water is needed there than is available at present.

High mountain ranges make up the southern sections of Oregon, and higher mountains bar the way across northern California. It will take much thought and action to bring water through these impressive mountains via tunnels or by means of huge pumping plants that may well exceed in size the present pumps at Grand Coulee dam. (Twelve pumps, the world's largest, each with a 65,000-hp. motor, lift water into canals in the Euphrata area of eastern Washington.)

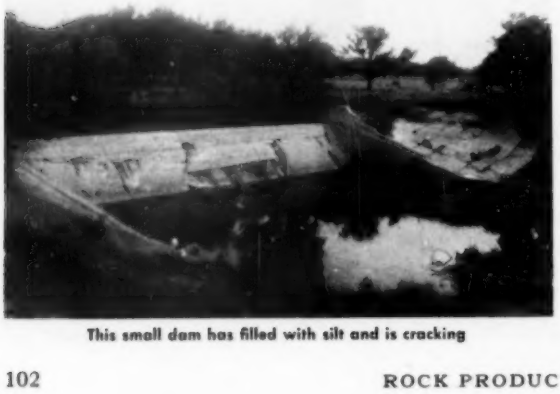
Dam proponents have presented a new thought recently. They believe that the future need for food by the world's population will become such that the nation which has food to sell will be, and will remain, the most powerful in the world. Food, they insist, will buy any scarce commodity regardless of the buyer's or seller's political affiliations. If we must have tungsten from the Communist nations, food will get it. If we need tin from Malay, food will get it for us. If the United States develops its food supply to the ultimate, this group maintains, it will do more for us and the Western Powers than sending billions abroad for foreign aid. They state that the development of the lower Mississippi river basin will help our allies more than sending them materials and financial aid today, and at a fraction of the cost.

There is also the "United Western Project," a proposal to get more water into the Colorado river. Present allocations of water to the states along the lower Colorado river, plus that allowed Mexico, account for about every drop of water that flows in the river. In Arizona and California there are still great deserts. If more water could be sent down the Colorado, a new empire could be added to what we already have there, it is claimed. The plan, in essence, is to dam certain streams in the Rocky Mountains, streams that now drain into the Mississippi river basin. Then by means of great tunnels, water will be drained west into the Colorado river basin. Several big dams on the Colorado and above Hoover dam would hold this water, developing more millions of kilowatts, and then send the water into the desert to augment current irrigation water. Such reversing of the direction of streams is feasible, as attested by the current Aluminum Company of Canada project to reverse a 5000 sq. mi. drainage area on the Nechako river.

In another case in Alaska, private industry proposes stream reversal on the Taiya power project where Miles Canyon dam will be built on the Yukon river. Water will be backed up to form a huge reservoir. By means of a series of big tunnels, one 13.5 miles long, another 7.7 miles, power will be developed from the water that has been made to reverse its direction of flow. The power plants will be located underground—in the heart of a mountain. The project's cost: $400,000,000; it would develop some 1,600,000 hp.

The dam builders are cognizant of the strip of land from the Canadian border to Mexico that includes the western parts of the Dakotas, western Nebraska, Kansas, parts of Oklahoma, and much of west Texas. This area has millions of acres of relatively flat land ideally suited for irrigation, with excellent climate range. They have watched the seasonal floods come down the Missouri, destroying everything in its path. They have studied the 200-acre relief map now under construction by the Corps of

*(Continued on page 128)*



**This small dam has filled with silt and is cracking**

**Kerr dam, a private power dam near Polson, Mont.**



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# Vibrating Conveyors for Clinker

**Dragon Cement Co. installs clinker conveyor system with low power demands, minimum abrasive wear and low overhead requirement**

CEMENT CLINKER always has presented a difficult conveying problem due to the abrasive character of the material, but Dragon Cement Co. has installed a conveyor system at its Northampton, Penn., plant which has low power requirements and has little abrasive effect on the conveying trough.

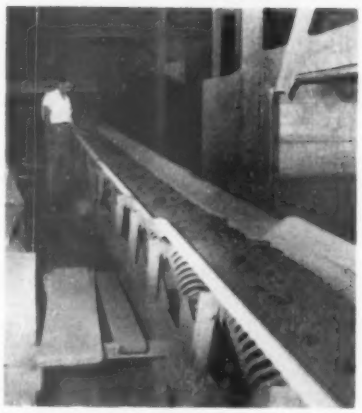
The installation comprises two Carrier Natural-Frequency conveyors, manufactured by Carrier Conveyor Corp., Louisville, Ky. Each unit has a normal load capacity of 5500 bbl. of clinker per day at temperatures as high as 800 deg. F., and with a size distribution ranging from fines to 8 in. The first of these conveyors receives the discharge from three kilns equipped with Unax coolers and also from outside clinker storage. Clinker is delivered on this conveyor to the second conveyor, at right angle to the first, with the second discharging to a hammermill.

### Construction

The first conveyor has a steel trough which is 85 ft. long, ⅜ in. thick, 12 in. wide across the bottom, constructed in one continuous piece. It operates at a 3 deg. incline, and is driven by a 5-hp. motor. When running empty, the motor draws 8 amp., but when carrying clinker at the rate of 115 t.p.h., and 90 f.p.m., it draws 12 amp. The second conveyor also has a one-piece trough 35 ft. long set at the same incline, but it is $\frac{5}{16}$ in. thick and 12 in. wide at the bottom. It has a 3-hp. motor drive, and when running empty, the motor draws 8.1 amp.; 8.8 amp. are required under load.

### Operating Principle

The small increase in horsepower input for conveyed load is attributed to the vibrating principle which lifts the clinker in a forward direction on the up stroke, cushions it to a stop on the down stroke, and again lifts it forward on the up stroke. The conveying action is therefore a series of "throws and catches." As the clinker does not slide or drag, it does not wear the trough appreciably. When the bed of material travels forward, the large pieces of hot clinker move to the top while the relatively cool, smaller pieces remain close to the trough. With no special provision for cooling, the temperature of the



**Transporting clinker in a one-piece steel trough conveyor vibrating at natural frequency. Clinker is carried up the 3 deg. incline by a series of "throws and catches"**

springs on which the trough rests remains at about 30 deg. above ambient temperature.

### How It Vibrates

The conveyors consist of a steel trough resting on heavy coil springs. The weight of the pan and the stiffness of the springs determine the frequency at which it naturally vibrates if the trough is pushed down and released. Once deflected from its neutral position and released, the trough continues to vibrate except for two small energy losses: the internal friction of the springs and the windage of the pan which gradually dampen it to a stop. A small motor makes up these energy losses to the pan through an eccentric arm, and keeps the trough vibrating at its natural frequency.

In effect, the springs act as flywheels, storing up energy from the trough on the down stroke and returning it to the trough on the up stroke. The trough floats on the springs which are uniformly spaced on short centers with a minimum of internal stress. This principle permits the conveyors to be built in lengths of more than 150 ft. with one drive.

### Maintenance No Problem

Maintenance is minimized as there is only one shaft to lubricate, and the coil springs reduce concentrated stresses. Impact forces in the drive are eliminated by the even, cyclical movement. An hydraulic shock absorber places all the weight of the pan and load on the springs instead of on the eccentric.

## Standards Bureau Reports

THE NATIONAL BUREAU OF STANDARDS has announced the publication of N.B.S. Miscellaneous Publication No. 204, "Annual Report—1951," a 105-page book summarizing scientific and engineering investigations conducted by N.B.S. during the fiscal year of 1951. The book also contains accounts of current activities and detailed descriptions of especially important scientific developments.

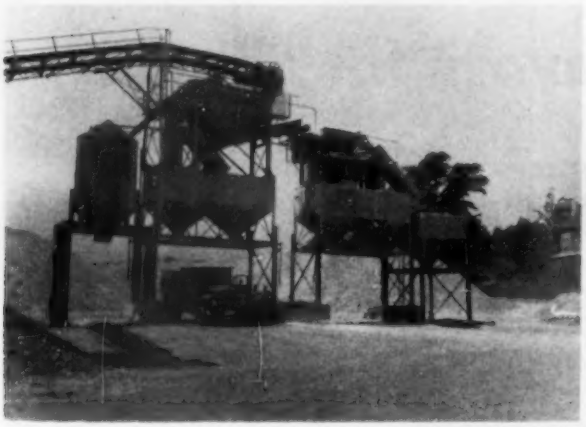
The text provides a general description of research and development of the following 15 scientific and technical divisions: mineral products; organic and fibrous materials; building technology; chemistry; electricity; optics and metrology; heat and power; atomic radiation physics; mechanics; metallurgy; applied mathematics; electronics; ordnance development; radio propagation; and missile development.

## Trade Names Handbook

INDUSTRIAL RESEARCH SERVICE, Dover, N.H., has announced the publication of the revised, 1953 edition of "Handbook of Material Trade Names." The revised edition contains 1000 pages with 15,000 trade-name materials listed, compared with the 5000 listed in the 1946 edition. For each trade-name material listed, the following information is given: (1) its physical and chemical properties; (2) its industrial uses; and (3) the name and address of the manufacturer or distributor with a list of the company's products.

A new feature of the revised edition is the designation of each trade mark that is registered with the U.S. Patent Office. Non-registered trade names, common names and generic terms are also differentiated. Another new feature is the "Use Classification" section in which all of the trade-name materials listed in Section 1 are cross indexed according to usage and composition.

Price of the book is $20 ($22.50 outside the United States). It is available from Industrial Research Service, Masonic Building, Dover, N.H.



Left: Main screening section mounted over the truck shipping bins. Right: View of the entire plant, with the exception of the crusher and feeder (out of sight at bottom right). Screening section at right receives undersize from the vibrating grizzly

# Small Plant Has High Capacity

**Valley Forge Stone Co., Malvern, Penn., uses vibrating grizzly ahead of primary crusher and does not return material**

By WALTER B. LENHART

OVER THE PAST two decades the pattern of plant construction in eastern Pennsylvania has developed towards high capacity, simplicity, permanence and attractiveness. The new plants in the area are streamlined, generally of all-steel construction, and operate without cover. This latter fact contrasts quite markedly with the older plants enclosed in corrugated steel sheeting, and which usually are quite dusty. All the newer plants operate dry without surge piles but with adequate bin capacity to handle truck shipping.

Over these same years design preference changed from permanent structures that could not be moved easily to a new site, to a rubber-tired portable plant, but apparently the 1952 model calls for a portable type of plant which is permanently mounted.

Another important aspect is in the selection of a primary crusher. As most of the new plants are either in limestone or dolomite areas, impact-type mills were favored almost without exception. There are several types of layouts. One is a single crushing unit for the plant. In this type the rock goes to the impactor and then is screened, with the oversize returned to the impactor. No secondary crusher is used. The second plan calls for secondary hammermills, and these operate in closed circuit with the scalper screen or screens over them. The third type calls for the same set-up as the second with the exception that a third and final reduction crusher is worked into the section of the plant following the hammermill operation. Lastly, there is the flow of material through the primary impactor and then to a scalper with oversize going for fluxstone. The primary product is sent over screens, with none returned. This latter system works well where the limestone, or a part of it, can go for metallurgical stone and other coarser types of crushed stone.

Truck loading in the quarry is done by the shovel in the background equipped with a 2½-cu. yd. bucket. Secondary breaking is accomplished by the drop ball on the crane

Tied in with these many types of operation is usually a method of removing early in the screening process a minus 1-in. to minus 1½-in. material that can be used for roadstone. This often carries variable amounts of fines that come from seams in the bedded limestone, or from residues after stripping. With the binder thus left in the stone it packs well and also often eliminates the necessity of washing the stone.

The trend in plant lubrication over these same decades has had its share of changes in practice. The trend has been away from open bearings and towards enclosed bearings lubricated through Alemite fittings.

The new plant of Valley Forge Stone Co., located on Morehall Road near Malvern, Penn., follows the pat-



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tern of a straight-line operation with no material returned to the crushing unit; also, fine material coming from the quarry is scalped out ahead of the primary crusher. The fines are carried by belt conveyor to a vibrating screen located over two hoppered-bottom steel truck bins. Two sizes of stone (including the fines) can be retained in these two bins and rejects can be sent to the belt conveyor serving the primary crusher. This longer conveyor delivers to two Cedarapids screens operating in series. The first one is a 4- x 12-ft. triple-deck unit, and the second is a 4- x 10-ft. two-deck screen. All operate dry. Under these two screens are five hoppered rectangular bins and one cylindrical bin.

The town of Malvern is about 20 miles west of Philadelphia. It is in an area that has been producing limestone and burned lime for 80 to 100 years. The site of the new operation was formerly that of the Valley Forge Lime & Stone Co. It is conveniently situated to serve by truck the sprawling Norristown-Philadelphia industrial and residential areas and much of the rich agricultural sections nearby.

The Valley Forge Stone Co. is owned by A. H. Reese, Paul Schneider and Clyde Creato. Frank Rarick is superintendent. The plant has a capacity of 400 t.p.h. Most of the equipment was manufactured by Iowa Manufacturing Co. The plant is essentially a Cedarapids stationary plant. Seven sizes of stone are prepared including a 5-in. fluxstone. The rock is said to be one of the hardest in the area.

Primary drilling is done on a contract basis by Lauman Drilling Co., Norristown. A Joy rotary drill is operated dry; on a 6-in. hole the unit drills at the rate of 25-30 f.p.m. The holes bottom at 100 ft. Du Pont Nitramon is the explosive used, set off with Primacord. A drop ball swung from a Michigan C-16 crane handles the secondary quarry breakage.

Primary loading is with an 820 Lorain diesel with a 2½-cu. yd. bucket. The shovel is powered with a Waukesha diesel; the bucket is Amsco. This loads a fleet of three 28FD Euclid rear-dump trucks. The trucks travel out of the pit to the apron feeder ahead of the 40-40 Cedarapids (formerly New Holland) impactor. Between the impactor and the discharge lip of the apron feeder is a Syntron vibrating grizzly, and any material passing this grizzly is sent to the separate screening unit over the bins. The primary impactor is driven by two No. 671 General Motors diesels. Cycoil air cleaners are placed on the air intakes to the diesels. A Budgit chain hoist is over the primary crusher. Material that is stockpiled is recovered by an International D-4 tractor equipped with Traxcavator.

Two diesel engines drive the double impeller primary crusher

Looking down the plant from above the receiving hopper

Apron feeder at receiving hopper is followed by a heavy-duty vibrating grizzly; primary crusher is at lower left

## Safe Driving Award

AZUSA ROCK AND SAND CO., Azusa, Calif., won the "Perpetual Sweepstates Award" of the eighth annual fleet contest, sponsored by the Fleet Transportation Division, Greater Los Angeles Chapter of the National Safety Council. The Azusa company, competing with 165 vehicular fleets from all segments of southern California industry, won the award by driving 60 vehicles a total of more than 2,225,000 miles, with a safety record unequalled by any of the other contestants for the amount of miles traveled, the number of vehicles and the type of transportation involved.

## German Cement Plant

PORTLAND-ZEMENTWERKE AG, Heidelberg, Germany, one of Western Germany's major producers, reported at a recent stockholders' meeting that the demand for cement in Germany continues to rise. The company has recently increased production capacity to help meet the rising demand. The company produced 1,950,000 tons of cement in 1951 and anticipates a total production of between 2,100,000 and 2,200,000 tons in 1952.

Greater production costs during the past year have been absorbed for the most part by the company, with only a slight increase in the price of cement. A 6 percent dividend was paid to stockholders in 1951. Richard Spohn, chairman of the board, stated that, but for legislation which limits dividend payments to 6 percent, a higher payment might have been made. He also announced that a 6 percent dividend could be expected for the 1952 business year.

# FINE GRINDING IN TUBE MILLS

**Research has shown methods of grinding cement clinker to a high degree of fineness and how particle agglomeration may be prevented**

By B. M. PEARSON*

FOR MORE THAN 50 years cylindrical tube mills have been used in numerous industries for the fine grinding of minerals of all descriptions. The method of operation of these mills would appear to be extraordinarily simple. Nevertheless, to obtain a good yield with the particle reduction desired, or in other words to obtain the best effect for a given amount of work, it is important to devote attention to certain considerations relative to the grinding.

These mills are characterized by a closed tube whose length is greater than the diameter and which rests on supporting wheels. Feed arrangements are located at one end. Ground products are discharged from the other end; in the interior of the mill is the grinding charge of steel or stone balls.

## Mill Fineness Determination

The material is reduced to a more or less fine flour in the tube mill. The determination of the fineness of the material produced is generally made with the aid of test sieves. Actually, this fineness determination gives no real indication of the work necessary for the grinding; it indicates only the quantity of fines which pass through or are retained on a given sieve, but this permits drawing no conclusion on the individual fineness of the isolated grains which have passed through the test sieve. This granulometry of the grinding is, as will be shown later, of the greatest importance in numerous cases. It is determined with the aid of equipment and procedures which have been specially developed for the purpose, either by the dry method and aspiration by air or else by the wet method and sedimentation. The ground flour is thus fractionated into elements which can be measured almost to a micron. On the basis of the values thus obtained, one has the means of deducing the specific surface on the basis of the elementary weight of the grains, and only this indication gives a survey of the real work of reduction realized during the grinding.

## Clinker Grinding

In practice, there are problems of grinding for which it is not sufficient to ascertain the oversize on a given test sieve, as was stated above as a general fact, but for which sure and certain conclusions can only be drawn from the granulometric analysis. As an example, take the grinding of cement (kiln clinker or blast furnace slag). In this case, conclusions on the grinding effect based simply on the material left on the sieve often leads to erroneous conclusions. Here, to obtain a good quality cement as well as high tensile and compressive strengths of the product, it is necessary to manufacture a ground flour having a high content of fine particles.

This condition is realized in a tube mill most completely when fine grinding takes place in a compartment charged with as heavy grinding media as possible, which reduce the material by violent blows. Grinding media which are too light do not strike hard enough; they slide and consequently give a flour which has too low a content of the very fine sizes. These differences in the fine particle size cannot be ascertained by means of test sieves, even very fine ones such as those of the German Standard DIN 0.09=90 microns or DIN 0.06=60 microns. The differences in the granulometry are of the order of 0 to 30 microns and these fractions are fundamental for the quality of the product. To produce a high grade flour in the tube mill one should accordingly use heavy grinding balls, which implies large ones. However, large grinding balls are only of advantage for the reduction of large particles; on the contrary, their effect is bad for an important reduction because a large grinding body obviously has less points of effective contact than a large number of smaller grinding balls. But the product of the weight times the falling speed of the grinding body gives the work which it is necessary to furnish to the mill. Thus one should study in detail each grinding problem to determine whether it is a question of obtaining a material having as fine grains as possible, and if this is not necessary or hardly desirable, to select the grinding media as a function of this fineness.

As was seen above, a flour high in fine grains is necessary in cement to obtain good covering power. On the contrary, for the fine grinding of raw materials and of coal for the pulverized fuel firing of the kilns, the objective is to obtain a grain of regular dimensions without a high proportion of fine particles being necessary. As a consequence, for the grinding of these latter two types of products, the utilization of very light grinding media in the tube mill is more economical than the employment of heavy grinding balls. Before grinding, therefore, one must consider the application of the ground material and fix the granulometry which it is desired to obtain. Then there is the question of determining quality of ground product desired as well as the economics of grinding.

In addition to tube mills with circulation of the products in the interior, tube mills with air separation are also used for fine grinding. In this procedure, the material which is reduced in size in a shorter drum is passed mechanically or by an air current to a separator where it is classified into fine and coarse particles. The fine flour is collected and the coarse grains are passed back to the mill for further reduction. The material to be ground, reduced by one passage through a short mill, has only a low content of fine particles on leaving the mill, but all the fine material can be separated up to the particle size desired in the separator. The coarse grains, separated from the fine flour, return to the tube mill, where they join the mill feed. A flour having a high content of fine grains can be obtained in a tube mill using a hard material feed, only if the duration of the grinding is long and if the grinding bodies are not too light in the finishing zone. The product to be ground must remain in the grinding cycle until the hardest and largest particles are reduced to a ground flour, all the particles of which pass through a given sieve or are retained only slightly.

In achieving this objective, the smaller and softer particles of the feed are subjected to the action of the grinding bodies along with the large and hard particles, and are ground into grains definitely smaller than the openings of the sieve serving to determine the fineness. By this means, one obtains a flour with a high content of very fine grains and with a high specific surface.

## Disadvantages of Fine Grinding

The production of a flour high in fine grains is, on the other hand, asso-

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Review of work by A. Schmid, *Revue des Materiaux*, No. 415 (1950) pages 140-142 and *Zement-Kalk-Gips*, Vol. 2, No. 4.



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ciated with a large number of undesirable material conditions which tend to retard the reduction process. For example, the grinding balls and the mill become coated with fine material which acts as a cushion and aids the formation of particles which constitute a refuse during the test on the sieve. This has been attributed to the humidity of the material being milled, but the more the raw material is dried, the more this phenomenon becomes noticeable. Today it is thought, and many facts serve to confirm this point of view, that during the grinding the very fine fractions become charged with a static electrical charge. If the product being ground is composed of different materials, which is currently the case, one part of the fine grains becomes charged positively and the other part negatively; they mutually attract each other and constitute bunches of agglomerated grains which hold together all the more strongly the finer the ground flour. This can clearly be seen under the microscope. These aggregations of grains are then crushed in the mill by the grinding media into small plates which either leave the mill simultaneously with the flour, or else adhere to the grinding balls and coat these, little by little.

For some years it has been the accepted theory in the grain milling field that grinding charges the fine flour with static electricity and that it is this which causes the sparks which are the causes of dust explosions in these mills.[1] To eliminate static electricity the mills have been grounded; this has served effectively to prevent such explosions.

## Moisture Addition to Avoid Particle Agglomeration

As it is not possible to ground tube mills effectively, it is necessary to seek other means for eliminating the electricity. The simplest means is to utilize the conductive properties of air, which is a conductor if it is saturated with moisture. Atmospheric air at normal temperatures holds a fair amount of water vapor. But the rubbing work of the grinding media in the mill generates a large quantity of heat which not only raises the temperatures of the product, the grinding balls and the mill itself, but also the air present in the mill or which is sweeping through.[2]

If, for example, the air temperature upon entering the mill is 10 deg. C. and the relative humidity is 80 percent, the humidity at 80 deg. C. (which is very close to the actual case) is no more than 5 percent and the air then becomes a very poor conductor of electricity. One must accordingly take steps to humidify the air artificially, which is done by vaporizing water using the frictional heat released in the mill.

Without knowing the reasons why, numerous fine grinding technicians know that the addition of water to the product being ground prevents coating of the grinding media and the formation of particle aggregations. The addition of water should obviously not be more than that necessary to vaporize, because a moist product could not be ground in the mill. For example, for the grinding of cement, it has been found that the addition of water to the clinker should be about 1 percent, e.g., for 1000 kg. of material it is necessary to evaporate 10 kg. of water, and about 6000 calories are necessary for this. To grind 1000 kg. of cement about 25 kw. of power are necessary, which is almost entirely transformed into frictional heat. As a consequence, there are produced about 25 x 860=21,500 cal. Because of this quantity of heat, the product to be ground and the air which leaves are heated and the added water can be vaporized.

If the material enters the mill at 30 deg. C. and is heated to about 80 deg. C., 50 x 0.2 x 1000=10,000 cal./unit time are produced. Conductive losses account for about 2000 cal., thus leaving 6000 to 7000 cal. available for vaporizing the water. Assuming an average speed of the air entering the mill, about 100 kg. of air are introduced per ton of material. By the addition of 1 percent water to the product, 1 kg. of air will become charged with $\frac{10,000}{100}$=100 gm. of water, due to which the air entering at 10 deg. C. with a relative humidity of 80 percent will have at 80 deg. C. a humidity of 40 percent, in place of the 5 percent it would have had without the addition of water. This example shows that it is possible to improve the electrical conductivity of the warm air leaving, and also that it is necessary to add a relatively large quantity of water to obtain good warm-air conductivity.

It is preferable to introduce cold air, since that is generally nearly saturated, at the location in the mill where the static electricity must be eliminated, that is to say, at the exit end since it is there that the fine dusts acquire their electrical charge. But in the actual design of mills, the air is arranged to enter at the material feed side. It then circulates in the same direction as the material being ground, passing through the mill and leaving the heated material at the exit end, the point where the electric charge is concentrated. One could accordingly modify the design of tube mills so that the air circulates counter-current to the material flow, thus bringing the wet, conductive air to the location where there is the most static electricity.

## Preventing Static Electricity

Apart from the employment of water vapor, the air can be rendered conductive by ionization by means of electromagnetic radiation. A German patent by H. Fecht, No. 642,055, covers a procedure for grinding organic and inorganic substances to extreme fineness, even colloidal, the characteristic being the treatment of materials during the grinding by x-rays or ultra-violet rays.

In the specification, it is stated that, as is well known, the most diverse materials, graphite, cement clinker, ochres, for example, can no longer be ground down any further when they have reached a certain fineness, but agglomerate instead. It is further stated that this trouble can be avoided or considerably reduced if radiation is applied during the grinding. The radiation serves to ionize the air in the mill and the static electricity due to the grinding friction is thus eliminated. As an example in the case of the grinding of cement clinker, the material retained on the German standard sieve DIN 0.09 was still 5 percent at the end of 35 min. grinding without radiation, but was only 2 percent at the end of 25 min. with radiation. The results were still more striking in the case of grinding graphite to extreme fineness.

As another means of avoiding the formation of aggregations and the coating of the grinding media due to fine grinding, a practical method consists of adding a certain percentage of carbon or of colophane to the material to be ground.

As regards the action of this addition on the elimination of the electrical charges, a clear explanation has not been forthcoming. On the one hand, carbon is a very good conductor of electricity, and on the contrary, colophane is a very bad one. It could be that with extreme fineness these materials act as electrolytes, and thus achieve an equalization of the electrical forces.

## Gypsum Mill Additions

Three percent raw gypsum is added to the clinker during the grinding to control setting time of concrete. If the clinker is not ground very finely, this addition is sufficient in the majority of cases to obtain a material with normal setting. On the contrary, with very fine grinding, rapid hydration is obtained in spite of the gypsum addition.

As was seen above, very fine particles which are strongly charged with static electricity are produced during the fine grinding in the tube mill. This results in the formation of aggregations. Koyanagi[3] has shown that the gypsum added is concentrated in these agglomerates; it is consequently tied up and cannot enter rapidly into solution in the mixing water. This lack of gypsum in the mixing water gives rapid setting characteristics to the cement.

The concentration of gypsum in the particle aggregation is explained by the fact that during the course of the grinding, by reason of its structure

and its friability, it is ground into very fine particles which become strongly charged with static electricity and are attracted by the cement particles of opposite charge. In this special case of gypsum mill additions the obvious remedy is to take steps to avoid the formation of static electricity, and in this way prevent the formation of the particle aggregations. As has been said above, the simplest way is to eliminate the static electricity in the mill by the air, which is easy to render conductive by adding water to the material being milled. Adding raw gypsum ($CaSO_4 \cdot 2H_2O$) to the clinker adds a definite quantity of water, of which 1.5 molecules can be vaporized at a relatively low temperature.

An addition of 3 percent of gypsum corresponds to about 0.5 percent usable water. This quantity of water is certainly too low to prevent the building-up of electrostatic charges with any certainty, but it can be sufficient if there remains in the material to be ground a small amount of vaporizable water, and if the grinding is not too fine, and if, at the same time, the electrical charge is not too high.

It is known that the addition of anhydrous gypsum (anhydrite) has no effect on the setting time in the majority of cases. The reason for this is that the water necessary to render the air conductive and to prevent the formation of particle aggregation is lacking. If it is desired to use anhydrite, it is necessary to add vaporizable water to the product to be ground so that the static electricity will be eliminated as soon as it is formed. This must be done so that no particle aggregations are formed in which there is the risk of the gypsum being concentrated.

The action of different types of gypsum on the setting time has been studied by R. Hayden, who took out a patent in 1943; the specification states that the patent covers a procedure for the regulation of the setting time of portland and other cements, characterized by the fact that the clinker can be ground or mixed with gypsum in any form and that the water which is necessary for the regulation of the setting time can be added, in any desired manner, during or after the grinding, inasmuch as it is not bonded to the gypsum.

In this way, Hayden recognizes that anhydrite can be utilized in the place of gypsum to control the setting time, if the water is added to the ground product, but it is considered that it is the water which conditions the setting time and that the calcium sulfate has nothing to do with the matter.

This opinion, according to which the water plays the regulating role, does not agree with the research conducted by Koyanagi. This worker has confirmed that the rapid setting cements are always transformed into slow setting cements if gypsum is added to the cement after grinding, whether it be gypsum in any form: raw, semi-hydrate or anhydrite. It is therefore the calcium sulfate which regulates the setting. But it must be capable of entering rapidly into solution in the mixing water and this is only possible if it is present as a well reduced pulverized material not tied up in particle aggregations.

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2. Mittag, C.; "Wo bleibt die Verlustarbeit bei der maschinellen Zerkleinerung?" *V. D. I. Beiheft Verfahrenstechhik*, No. 1 (1944).
3. Koyanagi, K.; "Grinding Duration and Setting," *Zement*, vol. 22, p. 371.


## Buys Feldspar Firm

INTERNATIONAL MINERALS AND CHEMICAL CORP., Chicago, Ill., acquired Consolidated Feldspar Corp., Trenton, N.J., on November 28. The agreement as announced provides that 108,534 shares of International common stock will be distributed among Consolidated holders. The rate is one share for each two and one-half shares of Consolidated common and two shares plus cash for each share of Consolidated preferred.

Consolidated Feldspar Corp., operates 13 plants in the United States and one plant in Canada and in addition owns substantial mineral reserves. Its operations consist of mining and processing various minerals.

## Tailings Pond

NATIONAL LIMESTONE CO., Sunbury, Penn., recently placed in operation a waste treatment system in compliance with requirements of the Sanitary Water Board, State Department of Health. The wash water at the plant formerly was pumped into Middle Creek and the company was accused of stream pollution. The company dug three large pits for settling the solids, and the overflow water is routed back to the stream. The company treats about 120,000 gal. of wash water a day by this settling process.

## Price Increase Denied

A REQUEST by refractory brick manufacturers for an increase in ceiling prices to offset forthcoming wage increases was turned down by the Office of Price Stabilization.

O.P.S. said a survey of the refractory industry showed that the industry was ineligible for a price increase, as determined by the "industry earning standard" which provides for ceiling price increases when earnings have fallen below 85 percent of the level obtained in the best of the three years from 1946 to 1949. O.P.S. stated that it may be eligible for an increase, however, once the increased labor costs take effect.

The price increase denial heightened the threat of union strikes in the industry which would idle 30,000 employes. Strikes have already been called against a few of the plants, while others have received strike notices. The object of the strike would be to force O.P.S. to grant price relief to the companies so that the firms can put into effect a new contract which would grant a 16-cent hourly pay raise and other benefits.

## Lime Sales

DOMESTIC SALES of open-market lime for the second quarter of this year totaled 1,816,867 short tons, as reported to the Bureau of Mines. Sales dropped sharply during the last month of the quarter, principally due to the curtailment of steel production during the steel strike.

In its monthly survey of lime, the Bureau of Mines asked producers to furnish annual figures on capacity, assuming that the kilns were operated 330 days per year, and excluding kilns not in operation within the last three years. Results of the tabulation indicated present annual lime-burning capacity to be approximately 8,600,000 tons.

The following table, prepared by the Bureau of Mines, shows the amount of lime in short tons, by types and major uses, sold by producers in the United States.

| | April 1952 | May 1952 | June 1952 | Total, 2nd Quarter, 1952 |
|---|---|---|---|---|
| By types: | | | | |
| Quicklime | 499,689 | 513,606 | 300,534 | 1,313,829 |
| Hydrated lime | 186,680 | 162,851 | 153,507 | 503,038 |
| Total lime | 686,369 | 676,457 | 454,041 | 1,816,867 |
| By uses: | | | | |
| Agricultural: | | | | |
| Quicklime | 8,437 | 7,276 | 3,214 | 18,927 |
| Hydrated lime | 34,897 | 22,743 | 15,977 | 73,617 |
| Total | 43,334 | 30,019 | 19,191 | 92,544 |
| Building: | | | | |
| Quicklime | 17,807 | 18,683 | 18,701 | 55,191 |
| Hydrated lime | 85,260 | 79,764 | 81,072 | 246,096 |
| Total | 103,067 | 98,447 | 99,773 | 301,287 |
| Chemical and other industrial: | | | | |
| Quicklime | 312,724 | 320,709 | 231,078 | 864,511 |
| Hydrated lime | 66,523 | 60,344 | 56,458 | 183,325 |
| Total | 379,247 | 381,053 | 287,536 | 1,047,836 |
| Refractory (dead-burned dolomite) | 160,721 | 166,938 | 47,541 | 375,200 |



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# PROGRESS MADE IN REDUCING ACCIDENTS

## National Safety Council holds 40th annual meeting; Cement and Quarry Section hears talks on safety engineer's functions, tools to reduce accidents and management's responsibility for safety

IT WAS 40 YEARS ago that a group of engineers and supervisors held the First Cooperative Safety Congress in Milwaukee, Wis. That meeting paved the way for the formation of the National Safety Council and its Safety Congress and Exposition. This year's meeting, held October 20-24 in five of Chicago's largest hotels, brought 12,000 delegates to hear the 500 speakers and view exhibits of 200 companies manufacturing safety equipment or promoting safe practices. The Cement and Quarry Section, with its excellent program, contributed much to the high acceptance of the Congress.

A new award given this year points up the attention given safety by the cement industry. The Portland Cement Association was one of six "trade associations" to be presented an award for exceptional service to safety. This gives recognition to the general excellence of the association's safety program and for the contribution in reduction of occupational injuries in the industry. The Council's technical committee and judges, in making the award, took into consideration accident prevention activities such as publicity, safety conferences, contests and publication of technical material.

### Program

The three-day session of the Cement and Quarry Section included a symposium on plant safety problems, talks on management's responsibility for safety, showing of sound-slide films demonstrating safe and unsafe plant practices, and election of officers. General chairman of the meeting was Lea P. Warner, personnel and safety manager, Warner Co., Philadelphia, Penn.

### Officers

Chosen as the new general chairman of the section was M. C. M. Pollard, National Gypsum Co., Buffalo, N.Y. Other members of the executive committee include T. W. Jones (vice-chairman) New Haven Trap Rock Co., New Haven, Conn.; Kent Jander (secretary) National Lime Association, Washington, D.C.; Seymour B. Fleming, (news letter editor) New York Trap Rock Corp., Newburgh, N.Y.; L. D. Cowling, (engineering committee chairman) Louisville Cement Corp., Speed, Ind.; Howard Riefenstahl, (membership committee chairman) Alpha Portland Cement Co., Easton, Penn.; Harvey F. Yotter (program committee chairman) The General Crushed Stone Co., Easton, Penn.; C. A. Gustafson (statistics committee chairman) The Callanan Road Improvement Co., South Bethlehem, N.Y.; H. G. Collins (visual aid committee chairman) Lehigh Portland Cement Co., Allentown, Penn.

M. C. M. Pollard, National Gypsum Co., was elected chairman of Cement and Quarry section

Members-at-large are (asterisks indicate past general chairmen): V. P. Ahearn, National Sand & Gravel Association, Washington, D.C.; E. W. Baumann, National Slag Association, Washington, D.C.; J. R. Boyd, National Crushed Stone Association, Washington, D.C.; *P. N. Bushnell, Universal Atlas Cement Co., New York, N.Y.; R. E. Copeland, National Concrete Masonry Association, Chicago, Ill.; A. J. R. Curtis, Portland Cement Association, Chicago, Ill.; F. R. Dittoe, The Kelley Island Lime & Transport Co., Cleveland 14, Ohio; *O. M. Graves, The General Crushed Stone Co., Easton, Penn.; C. J. Herzog, Keystone Sand & Gravel Co., Pittsburgh, Penn.; Ivan LeGore, Portland Cement Association, Chicago, Ill.; John Mather, Lone Star Cement Corp., New York, N.Y.; *Johan Norvig, Penn-Dixie Cement Corp., Nazareth, Penn.; Walter J. Scahill, Missouri Portland Cement Co., St. Louis, Mo.; *Lea P. Warner, Jr., Warner Co., Philadelphia, Penn.; W. E. Wing, Marblehead Lime Co., Chicago, Ill.; Seth Reese, U.S. Bureau of Mines, Washington, D.C.; *F. J. Buffington, New York Trap Rock Corp., Newburgh, N.Y.; and Lloyd Yeager, Gypsum Association, Chicago, Ill. National Safety Council's staff representative is G. G. Grieve.

In his acceptance talk, Mr. Pollard asked for more safety council representation from the West and South. There are 2000 quarry operators in the country, he estimated, but representation hasn't been proportional to the number in Western and Southern states. Furthermore, safety meetings should be held in those areas in addition to those in New York City or Chicago, he felt.

### Plant Safety Problems

Discussion leader of the symposium was Mr. Pollard. He first introduced James F. Collins, supervisor of personnel and training, Universal Atlas Cement Co., New York, N.Y. A redefinition of "safety" is necessary, Mr. Collins began. The dictionary definition, "condition of being safe; freedom from danger or hazard," is too static, in his opinion. This does not tell how safety may be attained. Equipment, posters and other trappings do not assure safety. This can be achieved by safeguards and training, the speaker said. Of course, the objective is to engineer hazards from each job. If this is well done, it will have a salutary effect on the worker. Education is nonetheless very important, according to Mr. Collins. Safety laws do not automatically make a job or plant safe; the effectiveness of formal training in achieving this was proved during World War II on a large scale, he said. Actual job instruction is one of the most important aspects of training the worker.

Two of the important functions of a company are recognition of the worker and giving the individual a feeling of belonging. Recognition is best accomplished by individual job training. Mr. Collins described the job breakdown (i.e., procedures involved) method Universal Atlas has instituted on jobs having a high accident rate. Eventually most other jobs will also have written procedures covering them. Each breakdown includes all important steps in the job, including easily overlooked but time-saving

steps. The written procedure serves as a guide for the supervisor in training the worker. Yet it is flexible enough for the foreman to add to it when changes are necessary.

Samples of a written procedure were projected on a screen. Also shown was a foreman's check sheet designed to show the state of each worker's proficiency in his job. Mr. Collins added that this system will be supplemented by an accident analysis plan, which would point up trouble spots. Training efforts would then be directed toward eliminating those errors.

A number of questions were raised by Mr. Collins' talk. Who writes the job procedures? he was asked. The plant safety director, assisted by the foreman. It is ideal to talk to the employe and watch him go through his work before preparing the analysis. Can't procedures be sent to all plants? Since job methods might not always be similar, they are written for each plant. What if the foreman can't write? Train him, Mr. Collins suggested. How are procedures written for non-repetitive jobs such as repair and maintenance? Analyses are sometimes written on an operation rather than on a specific job, for example, on shutting down a kiln.

Electrical hazards in small plants were discussed by John Murdock, master mechanic, Cedar Hollow plant of Warner Co., Poole, Penn. This speaker outlined the part a plant electrical department plays in achieving safe operations. Of course top management has to understand the problems, Mr. Murdock emphasized, and this understanding has to extend all the way down to the worker.

Hazards need not exist. Such things as failure to check switches off, failure to have multiple switch locks, failure to use proper tools, safe ladders or rigging occur generally because employes take shortcuts, the speaker said. Training should eliminate these, as well as the practice of using temporary wiring, improper condensers, inadequate machine grounding, and using electrical switch boxes as storage cabinets for bottles, etc.

C. A. Gustafson, superintendent, The Callanan Road Improvement Co., S. Bethlehem, N.Y., was the final symposium speaker. His subject dealt with the close connection between maintenance and safety. In too many plants, the speaker said, maintenance and safety departments are considered stepchildren since neither is considered a production service. Mr. Gustafson gave his definition of accident prevention as "stopping an accident before it happens," and where, he asked, can a better tool be found than the maintenance crew? A good maintenance crew often detects potential hazards in the course of its work, and will always leave a job in a safe condition.

One of the "indispensable" tools in his plant, Mr. Gustafson said, is a home-made hoist truck. Though any lifting mechanism should be used to ease back strains, he said that the drum hoist mounted on an old truck and equipped with derrick legs has proved most versatile. The bottom of the center brace of the derrick is movable so the derrick can be raised or lowered according to the demand of the job. The front bumper is weighted and a provision is made in the masthead to secure a sheave block, thereby enabling capacity to be increased. Patterned after truck hoists used by power companies for placing poles, the unit has been used for everything from bailing out well drill holes to setting a crusher in place, according to the speaker.

Another maintenance tool recently made available is the Reflectoscope, which Mr. Gustafson described as a machine to detect metal flaws and cracks in shafts and other parts without disassembling the equipment. Such an examination is much better than a visual examination, he said, for invisible cracks are readily detected. So far this machine is too expensive for most operators to purchase ($3000-$4000), though a unit may be rented in most localities.

Mr. Gustafson concluded with a look at quarry haulage units and quarry roads. These are very often neglected, he observed, because there is no advertising or service value in maintaining appearances as there is for highway trucks. Yet many accidents occur from poorly maintained quarry trucks, which often have no lights, brakes, windshield wipers, or rear view mirrors, to cite a few cases. Furthermore, haul roads frequently have gaping holes and piled up spillage, hardly conducive to safety, Mr. Gustafson pointed out.

### Management and Safety

The second session was opened with a talk by a man outside the rock products field, but who nonetheless had much of value to say to the members of the industry. The subject of A. E. Diem, vice-president of manufacturing, Dictaphone Corp., Bridgeport, Conn., was "Management and Safety." He dealt with management's duties in providing its employes with a safe place in which to work. Most managements fall down on this score and are motivated only when profits are affected, he admitted. What the speaker wanted to get across was that management has a responsibility to society.

The five ways listed by Mr. Diem by which a company can discharge this duty are:

(1) Provide a climate conducive to making employes want to work and one giving satisfaction to employes;

(2) Select or detect employes having mental anguish, then get to the bottom of the trouble and help them to get rid of it;

(3) Provide for inspiration, spirit and the money to make a plant a safe place in which to work;

(4) Make safety a fetish—shut down a job operation if it is unsafe, even though production suffers; in this respect management must back up its safety engineer—don't dilute responsibility by reversing inspection department's or safety engineer's recommendations; and

(5) Have an objective and try to get all the men (at least management) to have individual objectives; "He who serves best profits most," proclaims his firm's objective throughout the plant.

Mr. Diem had words to say about the responsibility of safety engineers, also. He advised them to know their jobs and to see the job of safety in the same light as management, making sure that both management and the workers appreciate and understand it.

Many questions were evoked by Mr. Diem's short talk. In particular, many members of the audience wondered how it was possible for a safety engineer to stop production if a hazard existed. The speaker pointed out that a responsible management cannot compromise with morality, that if it realizes an unsafe condition exists it is morally bound to remedy it before an accident can occur. One questioner asked how a safety engineer can get management to realize that a hazard exists when no action has taken place for some time after reporting it. The answer was similar: shut the job down. If management does not accept this, it is obviously not interested in safety, so Mr. Diem frankly advised a safety engineer placed in such a position to go elsewhere.

The safety engineer in his plant has no line authority, the speaker said. Foremen have the responsibility, but if a case arises where one does not agree to shut down a job, then the safety engineer has that authority. His company supplies all safety equipment, and if an employe does not use it he can not work. Among other questions asked were these, given with Mr. Diem's answers:

Q. Is there any employe participation in setting safety rules?

A. No. Furthermore, plant is unionized, too, but he has always been able to convince the union that safety is management's responsibility; the company provides the equipment, and its use is a requirement for work, though of course employes can offer suggestions.

Q. Is there any program to sell safety to foremen?

A. Yes, a meeting once a month appraises progress during the preceding month. Smaller meetings are held more frequently, and once a year a big company dinner is held



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for foremen, at which safety is stressed. A committee of five, including the safety engineer, inspects plants once a month.

Q. Are there safety meetings for employes?

A. No, none covering safety exclusively, though safety is a subject that is brought up at employe meetings. These are held once or twice a year, for half an hour after each shift; the company pays time and a half for this overtime. Attending the meeting is a condition of employment.

### Training the Workman

Other safety practices falling within a company were discussed by M. A. Gimbel, safety engineer, Bridesburg plant, Rohm & Haas Co., Philadelphia, Penn. He said that all safety engineering should be tempered with sound judgment. Though guarding is helpful in accident reduction, the most important practice is training of the worker. Mr. Gimbel then listed considerations to be given in a training program.

First of all, he said, the employe should be treated courteously. Don't order him around. Show friendship, in fact, let foremen go out socially with their men. In talking safety, talk injuries, not accidents. This indirect approach is frequently more effective, for instance, a worker may balk at being ordered to wear goggles, but when it is spoken of as eye protection much of the resistance will have disappeared.

Training of the worker is not the only important education program in a company. In fact, the effective training of supervisors is one of the biggest problems in industry today, according to the speaker. Since safety is a part of every job, supervisors should set an example. They should also know their men well and deal with them. It falls on the supervisors' shoulders to train the employes. Much of the morale of an organization will depend upon how effectively this is done and the manner in which it is accomplished. Mr. Gimbel contended that there is no substitute for the foreman who will take the time and trouble to teach his men.

The speaker was asked what should be done about a foreman who could not conduct a periodic safety meeting. He suggested letting an assistant help the foreman, or else a prepared tape-recorded slide-illustrated lecture should be given.

### Luncheon Meeting

An innovation this year, after a long lapse, was a Cement and Quarry Section luncheon. Speaker following the lunch was Major C. T. Estes of the Federal Mediation and Conciliation Service, who related some of his experiences in settling many labor-management disputes. One of the main difficulties in settling differences, he said, has been the breakdown in communication between opposing factions, in which case neither side understands the other's intentions or proposals.

### Visual Aids for Safety

Three sound-slide films were shown which effectively and humorously point up good safety practices. "Handle with Care" was made to reduce accidents in gypsum board warehouses. A new National Safety Council film showed proper operation of heavy-duty trucks on construction jobs or in quarry work. Gypsum Association's "Pass the Work Around" was also shown.

Visual aids that can be made in any quarry or plant were shown and described by A. B. Hoftiezer, safety supervisor, Laverack & Haines, Inc., Buffalo, N.Y. These consist of still pictures which are much cheaper to produce than sound-slide films and oftentimes more effective because of the personal touch. He has used 35 mm. cameras generally, since film is inexpensive and many pictures can be made on a roll. Three kinds of film have been selected for this work, Mr. Hoftiezer said: "standard" (panchromatic) film for pictures to be placed on plant bulletin boards, microfile film for legends, and direct positive film for making slides for projection.

Mr. Hoftiezer told some of the points he and his associates learned the hard way and which he wished to pass on as warnings. First, don't use too much light on your subject, he said, for highlights are easily blocked. When posing a shot be careful who you pick, and don't make pictures showing only mistakes—show some correct practice pictures also. Also, don't take flash pictures in a hazardous location without first warning the operator. Some of the slides the speaker projected on the screen illustrated his points. He apologized for the poor quality of one picture but the subject matter was what counted—a worker asleep on a conveyor belt, the starting button for which was located on the floor below!

Mr. Hoftiezer was asked if he had tried the Polaroid camera. He replied that the method described was perfected before Polaroid cameras gave black pictures, and there has been no necessity to change. As for color, he said it generally takes too long for films to be developed and that it is too difficult to use by the average plant photographer.

## Bulk Cement Carrier

THE CARGO VESSEL *Paul H. Townsend*, a 339-ft. diesel-powered craft owned by Huron Transportation Co., Detroit, Mich., subsidiary of Huron Portland Cement Co., has been converted into a Great Lakes bulk cement carrier, featuring what is claimed to be "the most efficient self-unloading system yet developed for pulverized materials." The unloading facilities use the air-activated gravity conveyor system, Fuller-Huron Airslides, which will discharge cement at the rate of about 4300 bbl., or 800 tons per hour. This is the second vessel in the company's fleet to be equipped with Airslides, the earlier one being the *Samuel Mitchell*.

## Fluorspar Exploration

KAISER ALUMINUM & CHEMICAL CORP. is conducting exploration work and stripping tests in the Black Canyon area of Pershing county, Nev. The region contains several fluorspar deposits previously explored by the federal government during World War II.

The Kaiser company is presently building a fluorspar mill near Fallon, Nev., which will be the first such plant in Nevada. The 50-acre plant site was purchased last March. Fluorspar concentrate will be shipped from the Nevada plant to the general chemical division of Allied Chemical & Dye Corp., which is building a new plant at Pittsburg, Calif., to make aluminum fluoride for Kaiser Aluminum's use.

## Silica Sand Plant

SPRINGDALE SILICA SAND CO., a newly organized firm, has begun production of silica sand at its new plant at Springdale, Wash. Plant capacity is approximately 100 tons per day. The company expects to be able to supply enough silica sand to meet all requirements of the Northwest. Previously, silica sand was shipped in from California, Illinois and Wisconsin. A 50-ton carload will be shipped daily to the naval station at Astoria, Ore., for sandblasting purposes. The company also has orders from manufacturers of roofing papers and shingles, carborundum, glass and plaster sand. The company is headed by Frank Eichelberger and J. W. Melrose.

## Sludge as Aggregate?

A RESEARCH laboratory maintained at Western Michigan College by Kalamazoo River Improvement Co. has been carrying out extensive research on waste, or sludge, from paper mills, treating and reducing it into a substance for potential use as a lightweight building aggregate. Aggregates, and block made with this aggregate thus far developed, containing substantial quantities of the sludge, were said to show unusually low specific gravity.

Members of the laboratory staff, headed by Dr. A. H. Nadelman, professor and head of the pulp and paper technology curriculum, are working closely with the building trades in further development of the sludge.

# Classifying System Anticipates Specifications

**The new plant of Texas Construction Material Co. at Eagle Lake, Texas, was designed to meet any anticipated sand specifications, no matter how strict**

By ROBERT H. KLOSSNER*

TEXAS CONSTRUCTION MATERIAL CO.'S new plant at Eagle Lake, Texas, emphasizes the trend of many operators to go ahead of the immediate specifications in the gradation of their products, aiming in general at the U.S. Army Corps of Engineers' specifications even though state and local specifications are not so strict. The Eagle Lake installation is currently working on a deposit that is essentially wastes and from older dredging operations, so little or no gravel is produced.

An Amsco 10-in. Form 39 dredge pump delivers the feed to the top of the plant at a static head of 52 ft. The pump is driven by a 250-hp. Allis-Chalmers variable speed motor, direct connected. Westinghouse controls are used. The current is carried to the dredge at 2300 volts where three 75 kv.-a. Maloney transformers reduce it to 440 volts.

The dredge hull is built up of two pontoons, each 4 x 9 x 25 ft. Each pontoon is divided into five watertight compartments making them extremely rigid and practically "sink proof." They are bolted together for ease in knocking down and moving to a new location.

The screen tipple uses 8- x 8-in. WF columns. This structure supports a 5- x 14-ft. double-deck Simplicity vibrating screen provided with an oil lubricator. The top deck uses a ⅜-in. square opening screen, from which the small amount of oversize is wasted. A $\frac{3}{16}$-in. square opening screen is used on the lower deck. The oversize from this deck is loaded by gravity directly into cars. The undersize, with all the dredge and wash water, flows to the classifying tipple at a distance of approximately 25 ft.

A Worthington 6-in. pump with a 50-hp. motor supplies about 1100 g.p.m. of wash water. This water is delivered to the screen through three spray manifolds on the upper deck and four on the lower deck. Each manifold is equipped with eight ½-in. spray nozzles.

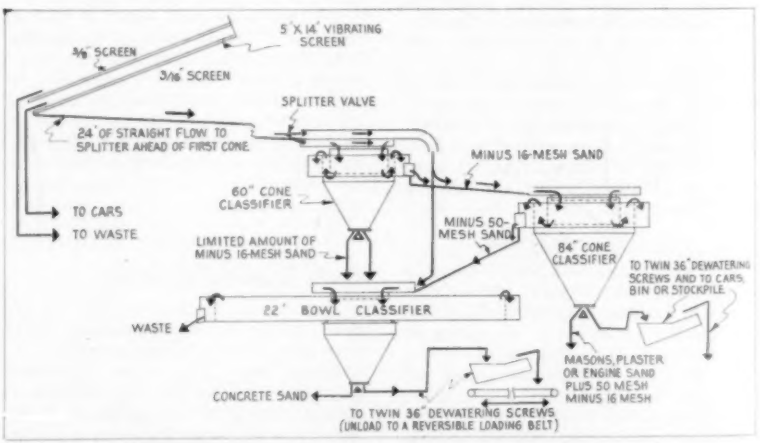
The system of classification used in this plant was first used in a plant of the Montgomery Gravel Co. built under the direction of the late F. M. Taylor who was then chief engineer of the Birmingham Slag Co. Since almost all natural sand has an excess of material passing 16 mesh and retained on 50 mesh, the object of this design is to remove this excess size automatically, recover it as a high grade mason, engine, plaster, etc., sand and then combine the coarser and the finer fractions in a machine suitable to recover the required amount of minus 100 mesh from the water and produce a thoroughly blended product of the proper gradation for concrete sand. The Auto-Vortex classifiers used were made by Charles E. Wood Co.

For the first separation, a 60-in. Auto-Vortex cone classifier is used. The split made in this classifier is at 16 mesh with the overflow carrying approximately 1 percent plus 16-mesh sand. An important feature in the control of the separation to be made in the first and second machine is the approximately 24 ft. of straight flow in a flat-bottomed launder with the splitter valve at the lower end, that is, ahead of the first cone. At the end of this flow practically all of the sand will be carried in the lower 1-1½ in. of the stream. At this point the splitter valve, or false bottom of this launder, can be raised or lowered on a valve stem to divert the lower part of the stream with the sand and the desired amount of water into the 60-in. classifier to effect the separation required, either above or below the 16-mesh size.

The excess water which is not used in this classifier is carried in a flume over the top of the cone for use in regulating the separation in the second classifier. The oversize product from the first classifier discharges directly into the center of the 22-ft. Auto-Vortex bowl classifier below.

All the overflow from the first classifier flows to an 84-in. Auto-Vortex cone classifier. This machine makes a separation at 50 mesh. The oversize product (approximately plus 50 mesh minus 16 mesh) is discharged to Eagle dewatering screens. There is normally a small amount of sand above or below these sizes, although the amount of plus 16 mesh can be increased by raising the splitter valve and introducing more water into the 60-in. cone, thus raising the mesh of the separation. Also the minus 50-mesh sand in the discharge product can be regulated to some extent by diverting all or any part of the water which is carried over the first machine into the 84-in. cone. A butterfly valve in the flume controls the amount of water used in this separation. All the overflow from the 84-in. classifier goes into the 22-ft. bowl.

The 22-ft. Auto-Vortex bowl classifier provides 364 sq. ft. of area and 63 ft. of periphery for overflow to assure settling of the required amount of minus 100-mesh sand. Slowly revolving rakes, driven by a 3-hp. Fairbanks-Morse motor, draw the sand into the discharge cone which is attached by means of a flexible dia-


5' X 14' VIBRATING SCREEN
⅜" SCREEN
3/16" SCREEN
SPLITTER VALVE
24' OF STRAIGHT FLOW TO SPLITTER AHEAD OF FIRST CONE
MINUS 16-MESH SAND
60" CONE CLASSIFIER
TO CARS
TO WASTE
MINUS 50-MESH SAND
LIMITED AMOUNT OF MINUS 16-MESH SAND
84" CONE CLASSIFIER
TO TWIN 36" DEWATERING SCREWS AND TO CARS, BIN OR STOCKPILE
22' BOWL CLASSIFIER
WASTE
MASONS, PLASTER OR ENGINE SAND PLUS 50 MESH MINUS 16 MESH
CONCRETE SAND
TO TWIN 36" DEWATERING SCREWS (UNLOAD TO A REVERSIBLE LOADING BELT)

**Flowsheet of material through Texas Construction Material Co.'s Eagle Lake plant**

*Formerly plant engineer, Texas Construction Material Co., Eagle Lake, Texas.



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**Left: Excavation of sand and gravel is by means of this dredge, equipped with a 10-in. pump. Right: Screening plant and classifiers located at rail siding (before installation of dewatering spirals)**

phragm to the bottom of the bowl. This discharge is automatically controlled by the same type of mechanism as the first two cone classifiers. The product from this machine meets the U.S. Corps of Engineers specification which had not been attained on similar sand before.

The final product from the 22-ft. cone falls to twin 36-in. Eagle spiral dewaterers. The two screws are used in parallel to dewater the ¼-in. sand. The screws discharge to a short reversible belt so that cars can be loaded on two tracks. There is no bin or hopper receiving the screw's discharge and, as the spirals operate continuously, this system was devised so that the sand being produced when a gondola was being spotted could be shuttled into the second car. The masons sand is loaded directly from the 84-in. cone.

The bowl classifier is handling approximately 4500 g.p.m. of water. The present tonnage is about 150 t.p.h. but it is expected to bring this up to 200 t.p.h. when better pumping conditions are obtained.

The crew consists of a pumper and helper on the dredge, one man to oversee the screen and classifiers and four men to handle the car loading. Maintenance help is provided from central shops.

One set of specifications this installation was required to meet was as follows:

| | | | |
|---|---|---|---|
| Passing | 4 mesh screen | 75 | to 100% |
| Passing | 8 mesh screen | 80 | to 98% |
| Passing | 16 mesh screen | 55 | to 70% |
| Passing | 30 mesh screen | 30 | to 60% |
| Passing | 50 mesh screen | 12 | to 30% |
| Passing | 100 mesh screen | 3½ | to 10% |

The shipments going out to fill the above specifications were as follows:

| | | |
|---|---|---|
| Passing | 4 mesh screen | 98% |
| Passing | 8 mesh screen | 87% |
| Passing | 16 mesh screen | 77% |
| Passing | 30 mesh screen | 53% |
| Passing | 50 mesh screen | 23% |
| Passing | 100 mesh screen | 4% |

## Officers

E. P. Gemmer is president and general manager of Texas Construction Material Co.; Dudley E. Baker is vice-president and production manager and L. L. Turner is superintendent of the Eagle Lake plant.

## Conservation Program

THE OVERALL FEDERAL conservation appropriation has been reduced slightly from $256,000,000 to $250,000,000 for the fiscal year 1953. More administrative funds have been allowed as there is a special allowance of 2½ percent available for so-called "down-the-road" farm contacts. While this feature will reduce the amount of money available for direct conservation practices, it will materially improve the administration of the program to the ultimate benefit of the limestone industry. The National Agricultural Limestone Institute plans to contact every individual farmer and discuss with him his total conservation needs, including the portion to come under the A.C.P. A.C.P. emphasis will be on practices which the farmer and Production and Marketing Administration committees determine to be most needed on the farm. The overall conservation needs are to be listed by the Committeemen and summarized in the county office. N.A.L.I. is attempting to have this information on limestone made available to producers throughout the country so that they can follow it up selling the farmer the full tonnage of liming materials which the farmer had determined as necessary.

The P.M.A. administrators at the Washington level have decreed that no state could spend for any practice more than 10 percent in excess of the amount assigned to that practice in the so-called "needs" formula. The total conservation needs of a state are developed in each state on the basis of agricultural data available, and these are used in determining its share of the national funds. In the past, each state has been able to spend its money in any way it saw fit. The result was that in nearly every state, the liming and other so-called annual or recurring practices received more than their proportionate share based on the total needs. Because of criticism in Congressional circles of this tendency, the administrators applied this restriction to the 1953 program. While in some areas this may result in a substantial reduction in the use of liming materials, the nation-wide agricultural limestone tonnage under the A.C.P. is not expected to be reduced by more than 10 percent.

**Looking down on the 22-ft. dia. bowl classifier and the two smaller cone classifiers**

## Nondelivery Brings Lawsuit

COLUMBIA GYPSUM PRODUCTS, Inc., Spokane, Wash., recently filed a $93,000 suit in federal court against Fidelity and Casualty Co. of New York. The suit charges that J. P. Carbon and Clyde M. Ludberg, bonded by the defendant, failed to deliver to the plaintiff 325,000 tons of crushed gypsum rock on a contract for 365,000 tons, at $1.90 per ton.

Secondary dust collector of the vortex separator type was installed at this asphaltic concrete plant to recover fine dust passing cyclone separator (left background) attached to rotary dryer

**Vortex separator type collector, used by flour and cereal mills, successfully adapted to the recovery of fine dust in mineral processing plants**

By ETHELYN WELLER

# Secondary Collectors for Recovery of Fine Dust

DUST is something that can play a dual role. It may be a safety and health hazard, or it may be a source of loss in operating costs, while at the same time being a necessary ingredient in some manufacturing processes. As most cities now have dust and smoke abatement ordinances, industries in which dust is created in their operations are faced with the problem of eliminating this source of public complaints.

Most plants have dust collectors. However, many of them collect only the coarser dust. Recovery of the fine dust has necessitated the use of a secondary dust collector. A dust collector of the vortex separator type, developed by the Dustex Corp., Buffalo, N.Y., for use in flour and cereal mills, has now been designed to collect fine dust in cement mills, limestone crushing plants and other mineral processing operations.

One of the first plants to install a Dustex collector for recovery of sand and limestone dust is Kendall Roadways, Buffalo, N.Y. This plant, making asphalt and black-top for road construction, handles about 400 tons daily. The process involves drying, at 400 deg. F., the sand and crushed stone which is elevated to the top of the plant, separated by screens into bins, and then drawn into a pug mill to be mixed in 2-ton batches. It is then loaded into trucks and hauled to the job. During this process there is appreciable loss of very fine sand and limestone dust.

The Cedarapids rotary dryer used in the plant was vented to a cyclone dust collector, but this unit did not collect the finest particles of the sand and limestone, with the result that numerous complaints were voiced by the public. The only solution seemed to be to install a secondary collector to supplement the work of the large cyclone. It was hoped that such a collector would not only solve the dust problem but also reclaim much of the valuable lost materials. Cloth and water filters were tried, but neither was satisfactory.

It was decided to try a Dustex 224 tube D52 collector as a secondary installation, making it an integral part of the Kendall dust collector system. It has been found to be entirely satisfactory. The dust problem has been eliminated, and plant executives report that at least 1 percent of all materials have been saved in the fine dust that no longer blows away. From three to four tons a day are recovered at a saving of over $5 a ton. While using the water collector, it was necessary to haul the sludge away daily by truck, and this saving in materials and the cost of truck hauling would also amount to about another $25 daily. Frank Standard, plant superintendent, estimates the entire daily savings at $50.

## How Collector Operates

This type collector is an assembly of 4-in. dia. miniature cyclones with an equal load distribution. In actual operation, the Dustex picks up specific volumes of air and dust through narrow openings and passes them into the series of miniature cyclones. A spinning action is started in a tangential inlet and creates a centrifugal force which carries dust particles to an outlet wall of the tube. The air is then reversed, going up an outlet tube, and the dust, now against the wall and having a downward movement, drops into a hopper or bin and is released.

The collector is so constructed that there is no recirculation between individual cyclones. It is possible to use these collectors at high velocities in installations where the moisture present previously made it practically imperative to use filter systems.

The Dustex unit can be tailor-made to any space requirements of the plant. This was done at Kendall Roadways. Here the hopper discharges by pipe to a screw conveyor which conveys the dust to the bins use as the final bituminous coating. The system was so installed that it required a minimum of work on the old cyclone set-up. The collector operates at a 6.0-in. w.g. positive pressure.

## Advantages

Advantages of this unit used as a secondary dust collector are as follows:

Materials formerly lost through the larger cyclone collectors and the wet filters used for the collection of fine sand and limestone dust are now collected dry, and can thus be put back into the original product.

There is little or no maintenance involved in the operation of the collector as there are no moving parts, except two rotary valves on the hopper. The collector normally requires no cleaning and no trouble with plugging in the individual miniature cyclones has been experienced.

It has been established that with these collectors, even for sand and limestone dust, there is no abrasion of the inlet sheet or in the small cyclones themselves, which are constructed of heavy gauge steel seamless tubing and sheet.



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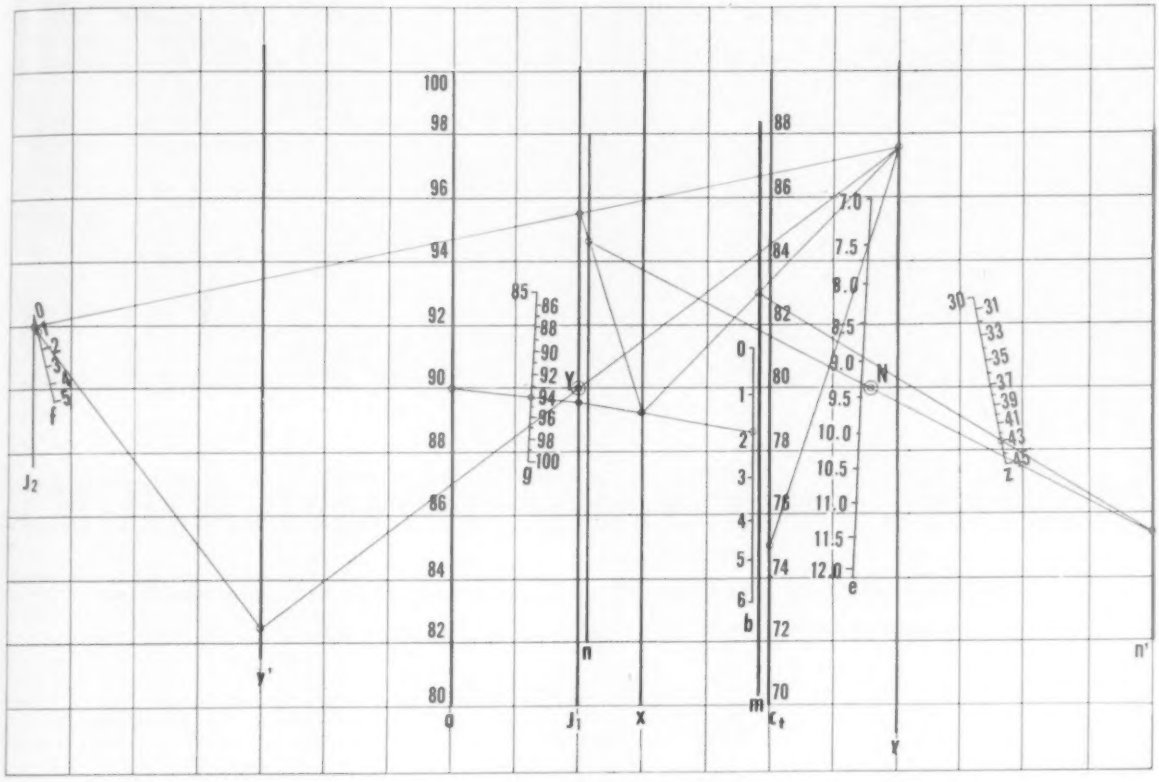
# NOMOGRAPH DETERMINES LIME KILN PERFORMANCE




THIS NOMOGRAPH for determining the performance of a lime kiln was made by J. D. Adhia, chemical engineer, Tata Chemicals Limited, Mithapur, Okhamandal, India. Taken into account are all the variables involved in the calcination of a typical limestone containing small amounts of magnesium carbonate. This graph, the designer suggests, would be of use in the chemical industry where lime and gas both are used, e.g., in the alkali and sugar industries.

*Example:*

Given a=90 b=2 c=73 d=4
e=7.5 f=1 g=94

Find "z"

*Method*

1. Align a=90 and g=94 to intersect at a point on the reference line $J_1$.
2. Align this point and b=2 to intersect at a point on the reference line x
3. Find $c_1 = c + \frac{d}{2} = 73 + \frac{4}{2} = 75$.
4. Align $c_1$=75 and e=7.5 to intersect at a point on the reference line y.
5. Align this point and the point on the reference line x to intersect at a point on the reference line m.
6. Align the point on the reference line y and the reversing point y to intersect at a point on the reversed reference line y'.
7. Align this point and f=1 to intersect at a point on the reference line $J_2$.
8. Align this point and the point on the reference line y to intersect at another point on the reference line $J_1$.
9. Align this point and the point on the reference line x to intersect at a point on the reference line n.
10. Align this point and the reversing point N to intersect on the reversed reference line n'.
11. Align this point and the point on the reference line m to intersect z; read off z=42.7 (calculated 42.65).

### Alignment Chart

a percent (dry basis) $CaCO_3$ in limestone
b percent (dry basis) $MgCO_3$ in limestone
c percent (dry basis) fixed carbon in coke
d percent (dry basis) volatiles in coke
$c_1$ $c + \frac{d}{2}$=total carbon in coke
e quantity of coke for 100 limestone
f percent excess air over theoretical requirements
g percent decomposition of limestone
$J_1$, $J_2$, x, y, m & n are reference lines
n' & y' are reversed n & y respectively
N & Y are reversing points
z percent $CO_2$ (by vol., dry basis) in the kiln gas

## Limestone Carrier

THE JOHN G. MUNSON, new 666-ft. steamer in the service of U.S. Steel's Michigan Limestone division, recently docked in Detroit with a 22,000 ton cargo of limestone for the Detroit chemical industry. It is the world's largest self-unloading vessel, and its 72-ft. beam makes it the widest ship on the Great Lakes.

A system of belt conveyors discharges limestone from the ship's hold into a bucket elevator near the bow. The bucket elevator transfers to another belt conveyor on the boom. Five thousand tons can be unloaded in an hour. The ship is a coal burner powered by a 7000-hp. electric drive.

Plant of Pequannock Sand and Gravel Co. is very compact

# MEETING FINE SAND SPECIFICATIONS

## Pequannock Sand and Gravel Co., Pequannock, N.J., recovers minus 100-mesh sand formerly lost by using a "liquid cyclone" classifier

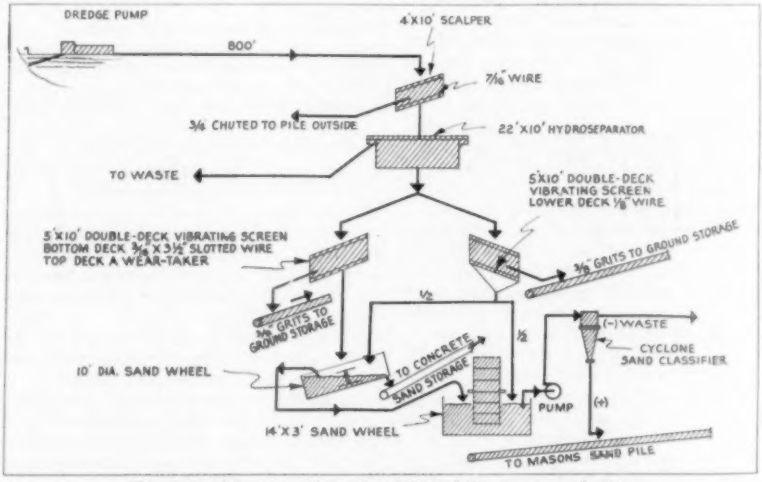
PEQUANNOCK SAND AND GRAVEL CO., Pequannock, N.J., is one of the first sand and gravel companies in the United States to install a DorrClone for recovery of sand in the minus 100 and minus 200 mesh ranges. This DorrClone installation is the first in a sand and gravel plant east of the Mississippi river.

ROCK PRODUCTS has in the past published references to this type of "liquid cyclone" classifier, in connection with the recovery of fine sizes of phosphate sands in Florida (see "Latest Recovery Methods High-Light Florida Phosphate Plant," March, 1951, page 74, and the Annual Review Issue of January, 1952, page 127). In these references the units were being used to recover a material whose physical characteristics parallel those of limestone. Phosphate sands are essentially calcium phosphate along with calcium and magnesium carbonates in variable amounts, so from an operating standpoint agstone and phosphate sands are quite similar. The phosphate sands recovered were in the minus 14 to plus 325 mesh range and the separation included the removal of clay slimes. Thus, the adoption of the DorrClone by Pequannock Sand and Gravel Co. is a pioneer operation as far as the sand industry is concerned.

The DorrClone was developed by the Dutch State Mines, of Heerlen, The Netherlands, for dewatering a minus 50-micron sand utilized as a dense medium in coal washing. The Dorr Co. acquired exclusive patent rights in all fields other than certain heavy-media separations, and since 1948 has engaged in development work for new fields of commercial use. It was first publicized in 1945 in connection with coal technology. From 1945 to 1948 several articles were published relating to its use in the coal industry and from 1949 to date some data have been made available in regard to its use in mining and metallurgical practices, notably in the phosphate fields.

The DorrClone resembles an ordinary cyclone dust collector but for operating efficiency is kept relatively small in size. Field tests have shown that a 24-in. diameter is the maximum that can be used effectively. A unit of this size will handle from 900-1500 g.p.m. of feed pulp depending upon the variables involved. So small and compact a unit easily fits into most operations.

In operation, pulp is pumped tangentially into the unit. The centrifugal force set up causes the heavier or larger particles to work to the periph-




Flowsheet of Pequannock Sand and Gravel Co., Pequannock, N.J.



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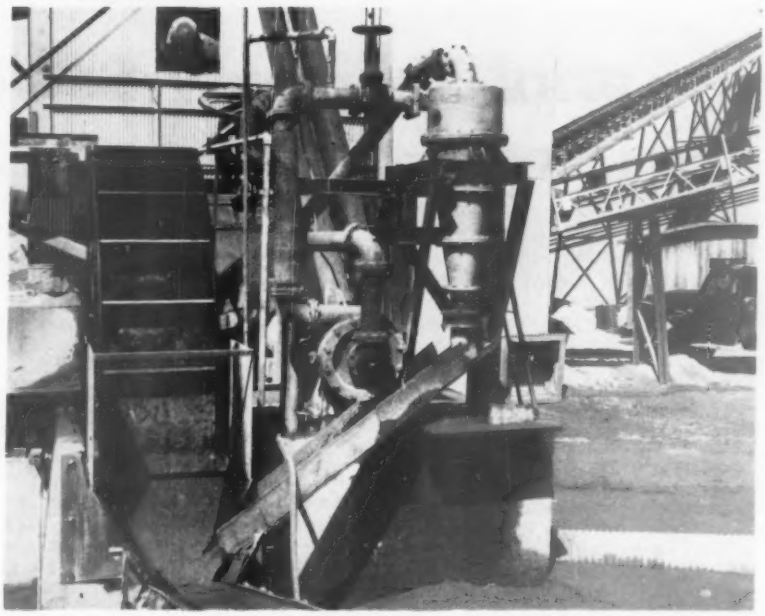
ery of the cone, and they gradually work downward and ultimately discharge through the apex of the cone. The slimes are discharged through the top of the unit. A unit normally operates between 7 and 35 p.s.i. The discharge can be ropy in appearance and contain such a small amount of water that the product blends well with plant-run sands. Thus, in sand operations, the discharge from the DorrClone needs no further dewatering. At the Pequannock Sand and Gravel Co. a 24-in. DorrClone is handling 980 g.p.m. of a feed which has 11 percent solids. The underflow is between 61-65 g.p.m. and contains 73 percent solids. The overflow or reject is 919-915 g.p.m. with approximately 4 percent solids content. The recovery is about 71 percent. Screen analysis of the cone's discharge is as follows:

| | |
|---|---|
| Plus 30 mesh | 1.0 percent |
| Plus 50 mesh | 4.0 percent |
| Plus 80 mesh | 5.0 percent |
| Plus 200 mesh | 77.0 percent |
| Pan | 1.3 |

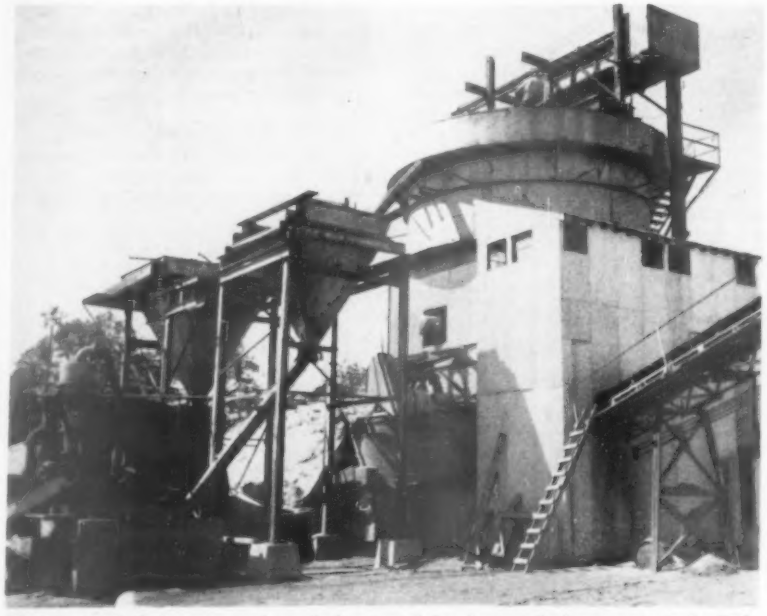
This fine sand is blended in with the masons and asphalt sand as needed.

At the phosphate operations previously mentioned, the density of the discharge is controlled through an automatic regulator that was developed jointly by The Dorr Co. and American Cyanamid Co. The operation of this automatic density regulator is based on the fact that a vacuum exists in the vortex and under normal operating conditions the magnitude or intensity of this vacuum can be directly correlated with the consistency of the cyclone underflow. This control unit has been named "Vactrol." When the Vactrol controller is used a tire-type apex valve is necessary. This valve resembles a doughnut. The elements of the Vactrol unit consist of a control instrument of the sensitive non-hunting type capable of operating in response to 0-10 or 0-20 in. of water control range. Changes in the vacuum are relayed to this instrument which in turn operates a pressure booster. A 100 p.s.i. air supply is connected to the apex valve through this booster so that pressures in the valve can be varied from zero to 90 p.s.i. in response to changes in the output of the control instrument. The vacuum therefore determines the size of the apex orifice and consequently the density of the discharge product. The Vactrol is quite sensitive and reliable in operation and will usually give a uniform discharge product.



Sand from the "liquid cyclone" classifier and the 14- x 3-ft. sand wheel fall to a common belt conveyor for transport to stockpile

Suction dredge with 50-ft. digging ladder excavates sand and gravel in pond



The 22- x 10-ft. hydroseparator is perched on top of the plant; at the lower center is the 10-ft. dia. sand washer

However, in the case at the Pequannock Sand and Gravel Co., the automatic control is not a part of the assembly. This stems from the fact that the deposit contains an excess of minus 100-mesh and minus 200-mesh sand at the start, and therefore no sharp separation is required to obtain the daily tonnage of fine sand necessary for raising the bulk to specification requirements. Control at this plant is accomplished by varying the size of the vortex finder and the diameter of the rubber apex ring at the sand discharge point. This doughnut-shaped rubber ring is encased in an assembly bolted to the main frame and can be changed in a matter of minutes. Although it is not recommended, the diameter of the outlet of the rubber doughnut can be decreased by tightening the holding nuts. At a Western sand and gravel plant, some

(Continued on page 124)

# Aerial Tramway Solves Quarry Transportation Problem

**Restricted area of plant site necessitated construction of tramway to transport bentonite from quarry to plant**

By CHARLES F. DWYER*

WHAT WOULD YOU DO about transportation if you found a valuable deposit on one side of a river, but the only suitable plant site was on the other side?

That was the problem that faced the Magnet Cove Barium Corp. Its officials knew that extensive bentonite deposits were available in the area east of Greybull, Wyo., and that large scale surface operations could be developed. Lacking utilities, railroad siding and roads, however, the plant had to be erected north of Greybull. Between the deposits and the plant site ran the Big Horn River.

Building a bridge was economically prohibitive because United States Army Corps of Engineers' restrictions demanded high, clear spans over the river at this point. The use of existing bridges added a 6-mile haul to the plant site, partially over near-impassable roads. This interesting problem was solved by the erection of an aerial tramway. The tramway offered physical, cost and time-saving advantages.

## Design 1600-ft. Tramway

Heron Engineering Co., Denver, Colo., provided the tramway engineering service, handled material procurement, and furnished construction supervision. A tramway approximately 1600 ft. in length and having a capacity of 60 t.p.h. was needed. Various types of tramways were considered; but the nature of the terrain, the distance to be traversed, the capacity desired and other factors led to the selection of the time-proved two-bucket jigback, or reversible tramway. In this type of system, large wire ropes form a suspended track over which two carriers travel in a reciprocating manner from loading terminal to discharge point. A single, continuous haul, or traction rope, operating through the reversible drive machinery, moves the carriers. With the elimination of intermediate supports, this system permits the handling of material at an extremely high rate of speed and consequent high capacity.

*Staff engineer, Heron Engineering Co., Denver, Colo.

Two-inch dia. Leschen "Hercules" flattened-strand wire rope was selected as track cable. The flattened strand was used for this purpose because it provided a large proportion of metal wire to the total cross sectional area; the strands are fitted together in a manner which offers maximum resistance to crushing, and a relatively smooth outside wearing surface is available. A ⅝-in. mild plow steel wire rope was chosen for the traction cable; since this rope was to pass over sheaves and through the drive machinery, flexibility was necessary in addition to strength and resistance to wear.

## Loading Terminal

The loading terminal for the tramway included the design of two 25-ton hoppers into which the trucks dump. Structural steel hoppered bottoms are mounted over the segmental bin gates. All gates are controlled from the operating platform with air valves and large air cylinders. Every precaution was taken in the design of bins and gates to meet the problem arising from the fact that bentonite when wet becomes extremely sticky. Bin and hopper walls were kept as nearly vertical as possible. The hoppers incorporated in the terminal served both as a gravity feed for the tramway and a large storage capacity to regulate the flow of material from the trucking operation.

At the discharge point, movable trippers are mounted on the track cables, providing automatic dumping for the carriers. The movable feature permits dumping at any point along the line and makes possible a stockpile capacity of over 100,000 tons. The large stockpile at the plant site permitted continual plant operation even during winter periods when surface mining and hauling were impossible.

One of the 50-cu. ft. buckets leaving the loading station and crossing the Big Horn river; processing plant is in background

## Tramway Construction

With the completion of all concrete work, the tramway erection was begun under the supervision of Charles

Loading station across the Big Horn river from the processing plant



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F. Dwyer of Heron Engineering Co. The erection of the steel tower was accomplished in record time with the aid of a large crane and experienced steel erection crews. The steel loading hoppers were positioned in the terminal and field-welded to insure sturdy, dust-tight bins.

In the drive terminal, the mounting of machinery was relatively simple. All machinery was held in place by anchor bolts cast in the concrete supports. Terminal sheaves directing the traction cable into the drive sheave were mounted on structural steel members fitted between the walls of the terminal structure.

### Stringing of Cables A Spectacular Job

Placing of the large track cables was the most spectacular part of the erection and drew a great deal of local interest. The 2-in. track cable arrived in a single length with sockets on either end. Over 1700 ft. in length, the cable on each reel weighed well over 6 tons. Two large tractors were employed to string the cable along the line, and to accomplish the precarious river crossing. A lead line of ½-in. wire rope was first pulled across the river by lighter lines, and this in turn was used to pull the large track rope across. The crane used in the tower erection was again employed to lift the track cable into position in the tower saddles. The ⅝-in. traction rope was pulled into place in much the same manner as described above for the 2-in. cables. With tension in the track cables provided through the hoist and anchorage reeving, the carriers were placed on the line and attached to the traction cables by wire rope clips. After proper alignment of drive machinery and sheaves, the tramway was ready for operation.

Movable tripper frames actuate the automatic bottom-dump buckets over the stockpile

## Western Phosphate Mining

AN ARTICLE in a recent issue of *Mining Engineering*, by Charles W. Sweetwood, superintendent, Gay Mine, Simplot Fertilizer Co., Fort Hall, Idaho, describes the growing phosphate mining industry in the West.

As stated in the article, the western phosphate field, virtually ignored for 40 years, has been undergoing a rapid climb to economic importance since World War II, due to the demand for increased food production and the growing needs of the expanding chemical industry.

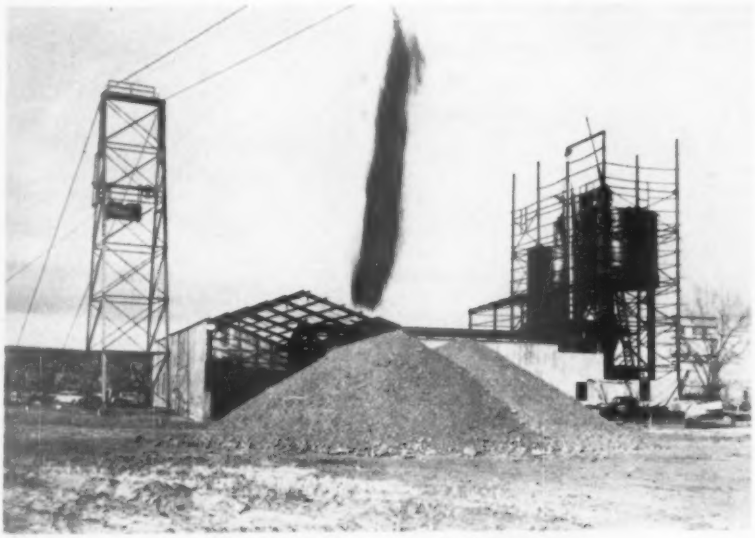
Simplot Fertilizer Co. was one of the first to become actively interested in the development of the western phosphate fields where approximately 60 percent of the nation's phosphate reserves are located. Exploration in August, 1945, resulted in the establishment of the Gay Mine which supplies high grade phosphate rock for processing into superphosphate fertilizer at the company's Pocatello, Idaho, plant. In the first year of mining, 53,000 tons of main bed oölitic phosphate rock were hauled to Pocatello for processing.

Exploration by core drilling brought to light the existence of some 21 ft. of phosphatic shales above the main bed, assaying at plus 24 percent $P_2O_5$. Blending the shale with high grade phosphate rock gave a standard of 28 percent $P_2O_5$. Westvaco Chemical Division, Food Machinery and Chemical Corp., uses these shales for production of elemental phosphorus in its electric furnace operations.

With the mining of shale for Westvaco, in addition to the recovering of high grade rock for processing into superphosphate, mining and loading facilities at the Gay Mine had to be expanded. A railroad and heavy-duty power lines were built to the mine.

The higher grade phosphatic beds are said to be found toward the base of the phosphatic shale member of the formation. Total thickness of the shale formation is approximately 150-180 ft., overlying the Wells formation and underlying the Rex chert member of the phosphatic formation. The lower 65 ft. of the shale member was said to be the "mineable" zone. The mining plan, according to the report, is divided into four phases: topsoil removal, waste shale removal, furnace grade shale mining, and the mining of the main beds of oölitic phosphate rock.

Close control of the shale is said to be necessary because of its heterogeneous nature—quality can vary rapidly in any section. Generally, main bed ore is removed by a 2½-cu. yd. shovel. The main bed ore is never stockpiled but is removed for immediate shipment. The phosphatic shale and main bed ore are first moved by Euclid and Kenworth rear-end dump trucks to the crushing and loading installation at the mine railhead. Ore is discharged into a 40-ton hopper and delivered by pan feeder to a jaw crusher, where it is crushed to a minus 3 in. size. A 30-in. belt conveyor carries the ore through an automatic sampler and into 65-ton hoppered-bottom railroad cars. Output is approximately 200 short tons, or an average of 30 cars, per 8-hr. operating shift. Plans are now underway for increasing output to 4000 tons per shift.



Stockpiling the bentonite at the processing plant area

## Cement Plant Auctioned

THE FORMER Cowell Portland Cement Co. plant at Merced, Calif., is being sold at auction. The plant was originally built in 1907 and has been shut down since 1946.

# AGGREGATE PRODUCTION FOR CANADIAN DAM

**Kenney dam on Nechako river will reverse 5000 sq. mi. drainage area; large aggregates requirement being filled by quarry and gravel plant at dam site**

KEY TO THE GIANT Aluminum Company of Canada hydroelectric project located in the mountainous wilderness back of the north coastal port of Prince Rupert is Kenney dam, now under construction to plug the canyon of the eastward-flowing Nechako River and reverse a 5000-sq. mi. drainage area.

The dam will back up water in a 110-mile chain of lakes which will be tapped at their western end by a ten-mile tunnel piercing a mile-high mountain range which separates the lake area from the coast. The water will plunge 2600 ft., passing through a subterranean powerhouse in which turbine generators will eventually produce more than 1,000,000 hp. of electric energy to supply Alcan's projected aluminum smelter at Kitimat on a nearby tidewater arm of the Pacific.

Kenney dam is of the earthfill type and will rise 317 ft. from a narrow base at the canyon floor. Crest length of the dam will be 1550 ft. with a crest width of 40 ft. The dam will contain 3,825,000 cu. yd. of material. It will be one of the largest earthfill dams on the continent.

Producing and supplying sand, gravel, clay and rock for the project involves extensive quarry operations, all of which are carried on within a few miles of the dam site. Fill requirements for the dam amount to 2,050,000 cu. yd. of porous sand and gravel, 585,000 cu. yd. of pit-run gravel, and 500,000 cu. yd. of impervious clay material.

Rock for the fill is practically at hand, being quarried within a few hundred feet of the dam crest on both sides of the canyon. Early in May of 1952, the first rock was brought down with a 200-ton dynamite blast, the largest ever fired in Canada. A second blast of 150 tons was made three weeks later, and a third blast of 175 tons took place in the middle of June. Slow velocity dynamite with 40 percent ammonia was used in all three blasts and average yield was 1 cu. yd. of rock per 1½ lb. of powder.

To save time and explosives, the coyote hole method of blasting was adopted. Main drifts are driven 200 to 300 ft. in depth, 50 ft. apart, with 4- x 6-ft. drifts cut at right angles to the main drifts. Whole boxes of powder are set in enlargements of the cross cuts and sealed with sand and rock. The resulting blast lifts and shatters the entire face of the rock wall, breaking off large boulders.

Left: Gravel is excavated from the Kemano river bed by 15-cu. yd. scrapers. Above: Loading of fine stone is accomplished by an overhead loader mounted on a crawler tractor

Before this method of blasting is done, the area to be shot is stripped by a fleet of seven International TD-24 crawler tractors equipped with bulldozers. The slopes to be stripped are so steep in some sections that the tractors pushing away the overburden are anchored from the top of the slope by winch cables attached to other tractors.

Blasted material is shovel-loaded into 10- and 17-cu. yd. end-dump diesel-powered Euclid trucks for the 6000 ft. round-trip haul to the dam site. Six shovels with bucket capacities of 2½ and 3½ cu. yd. are used for loading and quarrying, with International TD-24 tractors employed in cleaning up around the shovels and bunching rock for loading operations. A total of 31 trucks haul this material on a 50-ft. wide divided four-lane road which is constantly watered for better traction and to eliminate dust.

A central dispatch tower assigns all haul units to shovels for loading at the quarry site. All shovel numbers are painted on the side of the tower and returning haulage units are directed to a shovel by placing the haul unit number under the number of the desired shovel. This system has proved to be remarkably efficient in speeding up material handling.

The 690,000 cu. yd. of pervious gravel and sand fill are being produced from pits opened in the many low hills upstream from the dam site. At present, most of the material is produced at one pit and screened to meet three specifications: sand sizes up to ¾-in. gravel, ¾- to 3-in. gravel, and 3- to 10-in. gravel. This material is stockpiled near the dam site and loaded by small shovels and a TD-14A tractor equipped with an overhead loader into light dump trucks for the short haul to the dam. These pits also produce the 580,000 cu. yd. of pit-run gravel which will be placed in the dam structure.

About a mile from the dam site, a large deposit of inorganic glacial till with a moisture content of 4 to 6 percent provides more than enough high-grade clay for the dam's impervious core, which will require a total of 500,000 cu. yd. of this material.

The clay is prepared for loading by a scarifier pulled by a TD-24 tractor, and as this unit passes over the deposit, the clay is broken up and boulders are removed. Since specifications call for more moisture, the clay is wetted down before loading to meet the moisture content requirements.

In June, eight LeTourneau 12-cu.



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yd. Tournapulls were hauling the clay, with six more units to be added as the requirements increase with the rise of the dam. The Tournapulls are push-loaded by two International TD-24 tractors. Loading runs vary in length from 60 to 400 ft. since selective loading is practiced to obtain the desired balance of material in each load. The haulage units make the two-mile trip from clay pit to dam site in about ten min.

Approximately 110 miles west of Kenney dam lies the big Kemano construction project. This is the site of the underground powerhouse, and from there the power transmission line will wend its course over a mile-high mountain range to span the 50-mile distance to Kitimat.

Production of sand and gravel for the extensive concrete work at the Kemano river is now under way on a large scale. Three International TD-24 tractors pulling 15 cu. yd. scrapers reclaim and haul the sand and gravel from the river to a stockpile. Crushing and screening is done by a plant at the river's edge equipped with a Universal 20-36 primary jaw crusher powered by an International UD-18A diesel engine and an 880 Senior Gravelmaster powered by a UD-24 diesel. The latter unit produces sand and two sizes of gravel. Plant production is approximately 65 cu. yd. per hr.

The remaining third of the sand and gravel required for concrete work will be produced from small pits strung along the ten-mile road from Kemano Camp to the tidewater dock.

## Arizona Asbestos Mill

THE GOVERNMENT has announced it is considering establishing a mill and purchasing facilities in Arizona to handle chrysotile asbestos from independent producers in that state. Jess Larson, defense materials procurement administrator, said the United States is almost wholly dependent on foreign sources for high grade, long fiber, low-iron asbestos of the kind known to exist in Arizona.

He said the asbestos has been mined only on a limited scale and it is hoped that the contemplated program not only will stimulate increased production from known deposits, but also speed the search for others.

Mr. Larson said the principal reason why more deposits in Arizona are not being worked is that there are not adequate processing facilities in the area. It is planned that D.M.P.A. will contract with a private company for the establishment of a processing plant.

**Top: Blasts in quarry supplying rock for dam construction have ranged from 100 to 200 tons of dynamite. Center: Rock is loaded in quarry by the 3½-cu. yd. shovel into 13-cu. yd. capacity trucks. Tractor handles quarry clean-up work. Bottom: Fill for the dam comes from a 19-acre site near the dam; stripping, ripping and loading go on simultaneously**

# Lightweight Aggregates from Argillaceous Raw Materials

By F. O. ANDEREGG

KURT MEYER of the Lurgi Co. in Frankfurt am Main, Germany, has described* the rotary kiln method for making Haydite, the Globulite process, and aggregate production on the sintering grate. Examples of the first method include Haydite, Rocklite, etc., in the U.S., Klinker Isoliet in Holland, Argile Expandé in France, and Betonlinker in Denmark. This process requires a bloating clay or shale.

The Globulite process, invented by Maculan and covered by Austrian patent 162,841, consists of extruding a plastic clay in tubes, cutting these into lengths which pass into a rotating drum where they first roll into hollow spheres and are then dried. They next proceed into a zone where they are heated to between 1800 and 2000 deg. F. The selling price runs from 10 to 12 German marks per cu. m. (about $2.50 a cu. yd.) and the investment for a capacity of 100 cu. yd. per day is estimated to be $80,000. Concrete weighing from 55 to 110 lb. per cu. ft. can be produced with a compressive strength range of 400 to 3000 p.s.i.

A Lurgi sintering grate, installed in the Frankfurt plant for rubble recovery, has already been described (ROCK PRODUCTS, May, 1952, page 71). This process is very flexible; a considerable variety of raw materials and fuels can be utilized readily. The apparatus was developed for sintering iron ore. The finely divided raw material is mixed with the fuel and nodulated with a little water. It is spread onto the grate in a bed of desired thickness. After ignition in an oven, air is drawn down through the bed to produce the sintering. The temperature is controlled by the amount of fuel added and by the suction rate. In addition to iron ore and lightweight aggregate, limestone or magnesite may be calcined, portland cement clinkered, or sillimanite synthesized.

For making lightweight aggregate, a variety of raw materials is being used in Germany, such as coal washings, boiler ashes containing carbon, granulated slag and rubble fines. For the last, coke breeze or smoke precipitates may be used as refuse. The chemical composition of these raw materials varies within rather wide limits, e.g., silica from 28 to 70 percent, iron oxide from 1 to 16 percent, alumina from 2 to 37 percent, and ignition loss from 7 to 50 percent. The resulting products obviously vary considerably, but each plant tries to produce a uniform product. The bulk densities for the products produced range from 48 to 58 lb. per cu. ft. for fines, 0-¼ in., and lower for the coarser sizes. The aggregate absorptions vary somewhat, but usually compare favorably with cracked rubble aggregate or the German natural pumice (Bims). Typical concretes made from these products have unit weights of about 60 to 70 lb. per cu. ft., and compressive strengths of 750 to 1250 p.s.i., obtained with 8-in. cubes.

Many of the aggregates are irregular in shape and they must be rolled in a drum to knock off the weak, projecting edges. An example is given of results obtained with sintered coal washings. Using 2¼ bags (210 lb.) of cement per cu. yd., the concrete density was raised from 68 to 76 lb. per cu. ft. by aggregate rounding, and the compressive strength increased from 300 to 430 p.s.i. With sintered rubble fines and 3 bags per cu. yd., similar cited values were increased from 89 to 92 lb. per cu. ft. and the compressive strength raised from 750 p.s.i. to 890 p.s.i., by the tumbling in a drum.

Some experiments have been made with bloated clays, one being found in Holland and the other in the Elbe valley. The sintering process with down draft produced an aggregate 15 to 20 percent lighter than the rotary kiln process with the Holland clay. The grate requires less fuel, a cubic yard of aggregate from bloating clay using from 900,000 to 1,200,000 B.t.u. and the power range given is 8 to 10 kw.-hr. With a gas fuel it is not difficult to secure the spherical aggregates.

*Tonindustrie Zeitung, Vol. 76, No. 1, page 2 (1952)

## Acoustical Materials

THE AMERICAN SOCIETY FOR TESTING MATERIALS recently announced the availability of the new A.S.T.M. publication, "Symposium on Acoustical Materials," which discusses briefly the origin and history of the acoustical materials industry and outlines the many and varied problems to be solved. Papers included in the booklet discuss problems of sound absorption, maintenance, applications and the relationship of many basic physical properties, all of which are being approached by A.S.T.M. Committee C-20 on Acoustical Materials, whose purpose is to formulate suitable test methods and procedures for these materials.

Copies of this 40-page book may be obtained from headquarters of the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penn., priced at $1 each.

## Local Associations Increasing

A RECENT LIST compiled by the National Sand and Gravel and National Ready Mixed Concrete Associations indicates a decided trend toward an increasing number of state and area associations of the two industries. The following associations were listed:

Colorado Ready Mixed Concrete Association, Pueblo, Colo., J. A. Bullen, president.
Empire State Sand, Gravel and Ready Mix Association, Buffalo, N.Y.; Paul R. Smith, executive secretary.
Indiana Mineral Aggregates Association, Indianapolis, Ind.; Ralph E. Simpson, engineering director.
Iowa Ready Mixed Concrete Association, Des Moines, Iowa; R. V. Roupe, president.
Michigan Ready Mixed Concrete Association, Lansing, Mich.; J. Revell Hopkins, secretary.
Midwest Ready Mixed Concrete Association, Terre Haute, Ind.; R. E. Hutchins, executive secretary.
Montana Ready Mixed Concrete Association, Helena, Mont.; E. A. Fehlig, secretary-treasurer.
North Central Commercial Aggregates and Ready Mixed Concrete Producers Association, St. Paul, Minn.; J. L. Shiely, Jr., secretary-treasurer.
North Carolina Ready Mixed Concrete Association, Raleigh, N.C.; H. J. Stockard, Jr., executive secretary.
Northern California Ready Mixed Concrete Association, San Francisco, Calif.; E. R. Booker, secretary.
Ohio Ready Mixed Concrete Association, Columbus, Ohio; Claude L. Clark, secretary.
The Ohio Sand & Gravel Association, Columbus, Ohio; Claude L. Clark, executive secretary.
Ready-Mixed Concrete Association of Metropolitan Pittsburgh, Pittsburgh, Penn.; Ray V. Warren, engineering representative.
Ready Mixed Concrete Association of Wisconsin, Neenah, Wis.; Harold C. Mulvey, secretary.
Rock, Sand & Gravel Producers Association of Northern California, San Francisco, Calif.; E. R. Booker, secretary.
Southern California Ready Mixed Concrete Association, Los Angeles, Calif.; H. G. Feraud, executive secretary.
Southern California Rock Products Association, Los Angeles, Calif.; H. G. Feraud, executive secretary.
Texas Aggregates Association, Eagle Lake, Texas; C. S. McClellan, executive director.
Utah State Sand & Gravel and Ready-Mix Concrete Association, Salt Lake City, Utah; Allan E. Mecham.
Virginia Ready Mixed Concrete Association, Richmond, Va.; J. W. Mitchell, executive secretary.
West Virginia Mineral Aggregates Association, Charleston, W. Va.; P. J. Walsh, executive secretary.
Western Pennsylvania Sand & Gravel Association, Pittsburgh, Penn.; Ray V. Warren, engineering representative.



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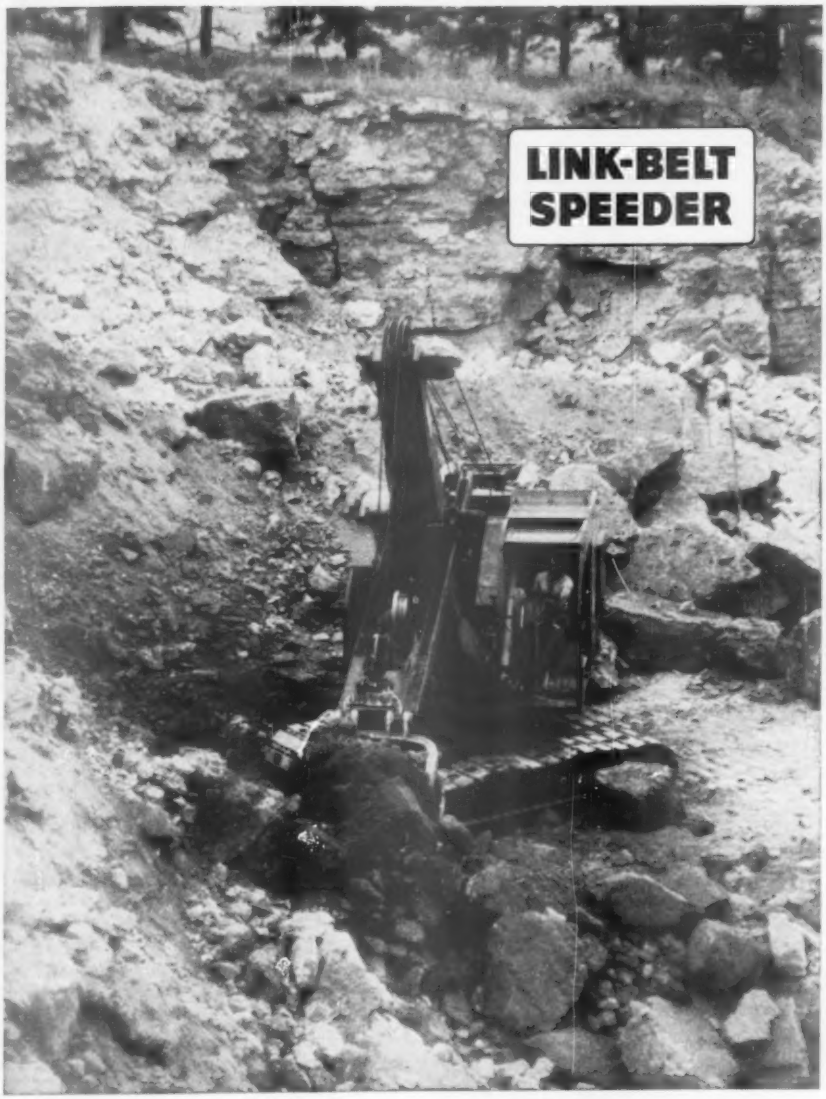
# Packed with brute strength

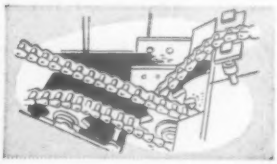
## LINK-BELT SPEEDER LS-90 shovel-crane



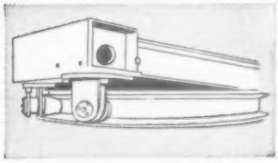

**WONN & BAILEY, Cobb, Wisconsin,** keep their portable crushing plant supplied by a real rock shovel—a husky Link-Belt Speeder. Massive all-welded construction, smooth steady power and ground-hugging stability make the LS-90 a favorite among quarry men.

**Here are LINK-BELT SPEEDER plus features that work for you**

**All-Welded Lower** — extra strength without extra weight. Resists impact and twist. Field service simple, fast.



**Independent Chain Crowd** — is fast and positive. Self-adjusting to all boom angles. No cables to break, slip or adjust.



**Hook Rollers** — Cone-shaped for *true* rolling. Reduce roller and roller path loads—eliminate center pin pull.

**High Ground Clearance** — eliminates snagging or fouling in rough areas. No projecting castings or easily damaged parts.

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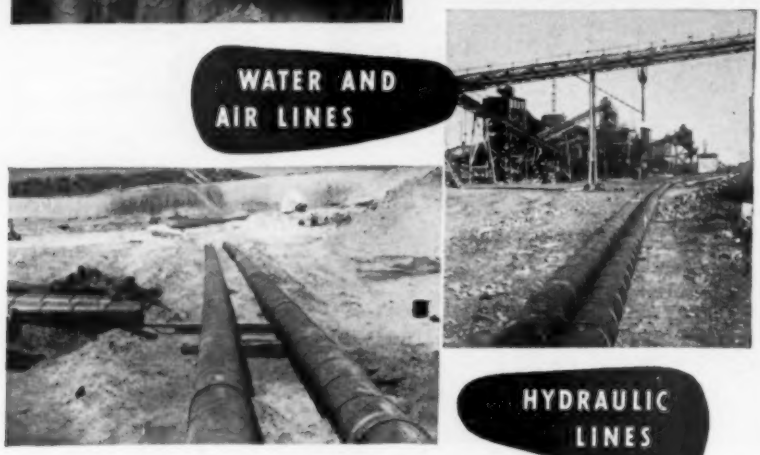


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NAYLOR PIPE

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*1237 E. 92nd St., Chicago 19, Ill.*
*New York Office:*
*350 Madison Ave., New York 17, N.Y.*


## Meeting Sand Specifications

*(Continued from page 117)*

measure of control was obtained by admitting air through an ordinary gate or globe valve in the pipe line feeding the DorrClone. This valve was located several feet from the cone where there was a slight vacuum. Admission of air at that point was an added means of control of discharge sand consistency.

Fig. 1 shows the general construction of the DorrClone and Fig. 2 gives some of the details of the unit. A tire-type valve is shown on the

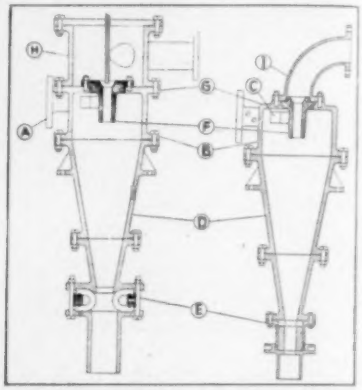


**Fig. 1: Construction of classifier: (A) feed nozzle; (B) feed cylinder; (C) feed shims; (D) cone; (E) adjustable apex opening; (F) vortex finder; (G) orifice plate; (H) spray chamber; and (I) elbow**

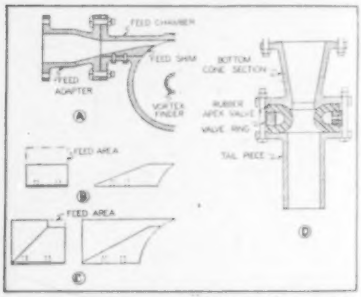


**Fig. 2: Details of classifier: (A) section through feed nozzle; (B) small shim; (C) large shim; and (D) detail of tire-type apex valve**

underflow. At Pequannock a disc-type discharge opening is used which must be regulated or changed manually. A 16-sq. in. feed opening, a 5-in. vortex finder, and a 3-in. apex discharge valve are used on this New Jersey unit. It operates at 35 p.s.i.

As pressure in the unit is raised the centrifugal action is increased, which causes more wear. Greatest wear is near the lower apex. Any or all sections can be lined with wear-resisting metals or rubbers. Since the cone is of cast construction, sections can be replaced as desired. Changing the vortex finder takes about 15 min.

Pequannock Sand and Gravel Co. is primarily a sand recovery plant. Some ⅜- to ¾-in. gravel is recovered as well as some grits (⅜ to $\frac{3}{16}$ in.) but the bulk of the tonnage is con-



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# *the New*

# OLIVER "OC-18"

## *the Operator's Dream come true!*

Here's a tractor that has been designed specifically to make life as easy as possible for the operator. Just check this list of "easy operating" features —it puts the "OC-18" 'way out in front as the tractor that gets more done . . . faster . . . every day.

**1. Over-Center Clutch.** The clutch bar runs across the full width of the dashboard. No need here for the operator to hunt for a single lever . . . to take his eyes off the work.

**2. Air Steering is *Standard Equipment*** You can steer the "OC-18" with just two fingers of one hand.

**3. Push Button Electric Starting.** The husky starter of the "OC-18" gets the engine going . . . quick.

**4. Cold Weather Starting Aid**...standard equipment on the Oliver "OC-18" for fast, easy starting in extremely low temperatures.

**5. Center-Positioned Gear Shift Lever** . . . is located right where it's easiest to reach.

**6. Ample Leg Room** . . . no cramped legs after a hard day's work with the "OC-18".

**7. Convenient Foot Parking Brakes** are standard equipment on the "OC-18".

**8. Comfortable, Two-Man Seat** . . . plenty of room for two men in this upholstered seat.

**9. Easy-Acting Friction Throttle** is located at the right arm rest of the seat in the most convenient position for the operator.

**You get plus performance too! A full 126 drawbar horsepower . . . greater stability . . . more track on the ground. Just note the photograph. See how the track hugs the ground almost its entire length. It means real pulling power . . . greater stability and better balance for dozing.**

**Try out this great new tractor yourself. Ask your Oliver Industrial Distributor to arrange a demonstration. When you've seen the "OC-18", you'll never be satisfied with any other big tractor.**

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**400 West Madison Street, Chicago 6, Illinois**

***A complete line of industrial wheel and crawler tractors***

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"DEISTERS
Stand-up Far Better"
Enthused over Snyder & Sons' new Deister screen, Supt. Moss Davis said, "I've been in the gravel business 25 years and have used many makes of screens—but Deisters stand up far better than any other."

That was the consensus found among aggregates men by M. G. Snyder and Sons, Dayton, Ohio, aggregates operators, when they needed to replace an unsatisfactory screen a year ago.

Now, R. L. Snyder, General Manager, reports their satisfaction this way: "This is our first Deister. We like the way it turns out the work. When we found it necessary to replace an unsatisfactory screen, we checked with other plants around here, and bought a Deister because of the excellent reports we got on it."

Wire, phone or write for detailed information on Deister screens or the new Deister electric screen heating units.

**DEISTER VIBRATING SCREENS & DEISTER ELECTRIC SCREEN HEATERS**

DEISTER SCREENS

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crete, masons and asphalt sand, etc. An Amsco suction dredge with a 15-in. suction and a 12-in. discharge is used for recovery. A 50-ft. Swintex digging ladder is provided and digging is 35 to 40 ft. below water surface. If deeper digging is needed, the water level of the pond is lowered by allowing the water from the screening and washing plant to by-pass to a nearby creek.

The Amsco dredge pumps a distance of about 800 ft. to the plant and into a 4- x 10-ft. double-deck Seco scalping screen which has $\frac{7}{16}$-in. wire on the lower deck. The top deck is a wear-taker. The oversize material is chuted to a pile alongside the plant. The tonnage of this material is small. The minus $\frac{7}{16}$-in. material falls to a 22- x 10-ft. Dorr hydroseparator along with the water from the 12-in. pump. The overflow from the hydroseparator is wasted.

The hydroseparator underflow is divided between a 5- x 10-ft. Robins and a Simplicity double-deck vibrating screens. The former has a lower deck of $\frac{3}{16}$- x 3½-in. slotted wire and the lower deck of the Simplicity has ⅛-in. wire. In both cases the top decks are wear-takers only. The $\frac{3}{8}$-in. grits produced are transferred to ground storage. All the fines from the Robins screen and one-half the fines from the Simplicity screen flow next to a 10-ft. dia. Dorr sand washer from which the concrete sand is recovered. This product is transferred to its ground storage pile. The sand washer overflow and the remaining half of the Simplicity sand screen overflow then flows to the sump of a 14- x 3-ft. Simplicity sand wheel. This wheel operates in a large concrete sump and accounts for the recovery of the bulk of the masons and asphalt sand. A 6-in. Amsco sand pump driven by a 25-hp. motor picks up a portion of the sand wheel's overflow when additional fines are desired and pumps it to the DorrClone. The recovered fine sand is then blended with that produced from the sand wheel. All products recovered are clean, sharp and free from clay or other contaminating inclusions. The plant has a capacity of 300 t.p.h.

Stripping of the deposit is done with an Allis-Chalmers HD-15 tractor and dozer. The plant has access to the Erie railroad but a greater portion of the plant's output is hauled by truck. A Webb platform truck scale is available. Stockpiled sand is recovered by a Haiss loader.

The Pequannock Sand and Gravel Co. is owned by the Union Building & Construction Co., Passaic, N.J. Joseph R. Ward is general superintendent.

## $200,000 Fire

CHANDLER SAND & GRAVEL CO., Lomita, Calif., plant, was swept by fire that caused damage estimated at $200,000. The plant was scheduled to be put back into operation.



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# 4-wheel drive PAYLOADER®

Palmetto Quarries takes tons of tough, stubborn granite from its Columbia, South Carolina quarry. With two large electric shovels and a fleet of 15 ton trailer trucks to keep moving, there are lots of chores for its 1½ yd. Model HM "PAYLOADER" tractor-shovel . . . there's clean-up around the shovels, starting and pushing stalled trucks, building and maintenance of roadways, loading odd lots of rock, cleaning-up around conveyors, and many other jobs.

This 4-wheel-drive "PAYLOADER" replaced a big crawler tractor and the management cites the following benefits: (1) does all the work the tractor did (2) gets around faster (3) shows savings in operation cost over tracks (4) provides an additional loading tool and (5) the tractor operator is much happier.

Model HM's are helping quarry and pit operators all over the country to increase production and reduce costs. You are invited to find out how "PAYLOADERS" can help you too. The Frank G. Hough Co., 705 Sunnyside Avenue, Libertyville, Illinois.

WRITE for catalog on the 1½ yd. Model HM or the six other sizes of "PAYLOADERS" down to 12 cu. ft. bucket capacity. There's no obligation.

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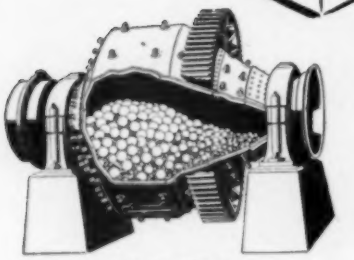
# IS GRINDING YOUR PROBLEM?



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— The Hardinge Conical Ball (or Pebble) Mill is unequaled in efficiency. Grinds wet or dry, in open or closed circuit. Outstanding feature: natural size segregation of grinding media, from feed to discharge. Bulletin 17-B-7 for dry grinding; Bulletin AH-389-7 for wet grinding.

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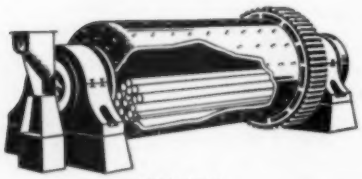
— Same ball segregation effect as obtained in the Conical Mill, plus additional grinding volume. Ideal for large capacity operations. Bulletin AH-414-7.



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— Ideal for producing minimum oversize in open circuit grinding. Grinds either wet or dry. Convex heads reduce friction, prevent congestion of charge at the ends, and align the rods. Bulletin 25-B-7.

**TUBE MILLS**

— For a fine product in open circuit without the use of classifiers. For mixing and grinding to secure a smooth texture or plastic product. Bulletin 18-B-7.

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**CYLINDRICAL MILLS**

— The Cylindrical Ball (or Pebble) Mills have demountable trunnions, and convex heads to reduce head liner wear and increase mixing action. Supplied with or without grates, as required. Bulletin AH-389-7.

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## Dams and Rock

*(Continued from page 102)*

Engineers at Clinton, Miss., (a gigantic scale model showing the drainage systems of the Missouri and Mississippi basins). Water is available on one hand; semi-desert land is found on the other. Seven giant reservoirs on the Missouri river plus some 97 on the Missouri and the Mississippi tributaries, plus thousands of small dirt check dams are needed, making millions of kilowatts available annually that could be developed and used to pump water. It gives a use for the flood waters of the Missouri and puts parched land under the plow.

The opponents of these plans think the project is beyond human accomplishment. The planners themselves feel, however, that we should be able to accomplish all this and more. Aren't engineers, it is pointed out, moving 1,000,000 cu. yd. of earth every week at a new dam construction site?

## Perlite Meeting

THE PERLITE INSTITUTE held its annual meeting in Minneapolis, Minn., October 1-3, 1952, with representatives of 35 perlite producers from 20 states participating.

Lewis Lloyd, president, Alatex Construction Service, Inc., New Orleans, La., was elected the new president for a 2-year term, succeeding J. John Brouk, Precast Slab and Tile Co., St. Louis, Mo. Mr. Lloyd is the third president of the institute since its formation in 1949. He is also vice-president and director of the National Concrete Masonry Association and vice-president of the Texas Concrete Masonry Association.

J. C. Kingsbury, president, F. E. Schundler & Co., Inc., Joliet, Ill., was elected vice-president and three new members were named to the board of directors: Neal D. Snyder, Combined Metals Reduction Co., Salt Lake City, Utah; K. J. Bercaw, Great Lakes Carbon Corp., New York, N.Y.; and Kirk E. Hazelton, Cleveland Gypsum Co., Cleveland, Ohio.

In other official action, the board of directors approved the membership application of MacArthur Co., St. Paul, Minn., increasing to 46 the number of active perlite miners and processors in the institute.

A number of reports on new uses of perlite were given at the 3-day meeting, one of which was the use of expanded volcanic rock as an additive to foundry sand. Foundrymen in several sections of the country were said to have reported good results in the use of expanded perlite as an additive to facing sand, core sand and as an aggregate in the production of precast insulating risers. Because expanded perlite is a completely dry material, containing no gas-forming element, and has a low linear expansion, its use is said to improve the permeability of foundry molds and eliminate many casting defects com-



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# Here's higher production for your kiln!

BECAUSE they are *designed especially* for cement kiln hot zone linings, Permanente Periclase-Chrome refractory brick give you top performance, cut down on excessive replacements which rob you of valuable production time.

Verified performance records of kilns throughout the country show that Permanente Periclase-Chrome bricks have withstood as many as *17 shutdowns* for various causes *without any loss of brick due to spalling.*

With Permanente Periclase-Chrome brick you get a lining of maximum refractoriness with high resistance to chemical attack by cement clinker. It takes a good coating, holds it well, and has great resistance to thermal shock.

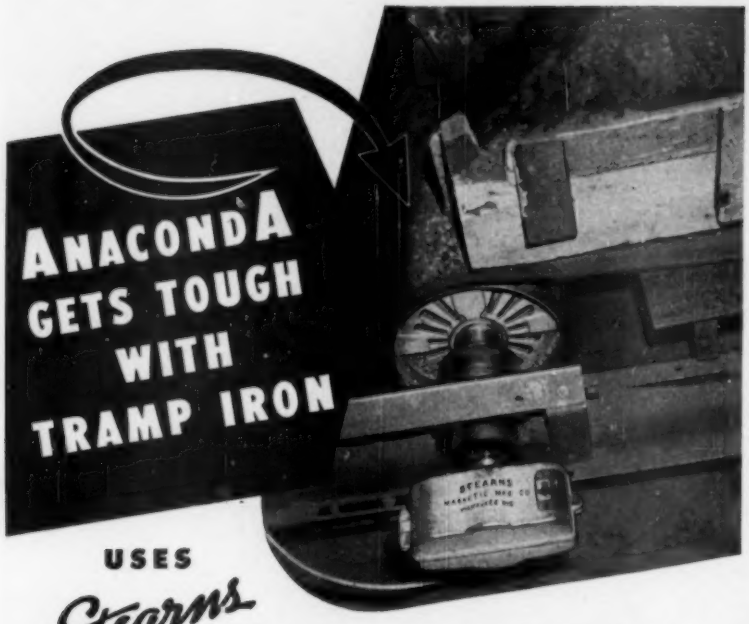
For more than 10 years, Kaiser Chemicals has been providing specialized brick to the cement industry. This experience is available to you—including installation assistance—at no extra cost.

Standard brick sizes supplied in both burned and chemically bonded forms. Recently expanded facilities enable us to better take care of your needs. Call or write principal sales offices: *Chemical Division,* Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.

# Kaiser Chemicals

**Pioneers in Modern Basic Refractories**

***Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase***

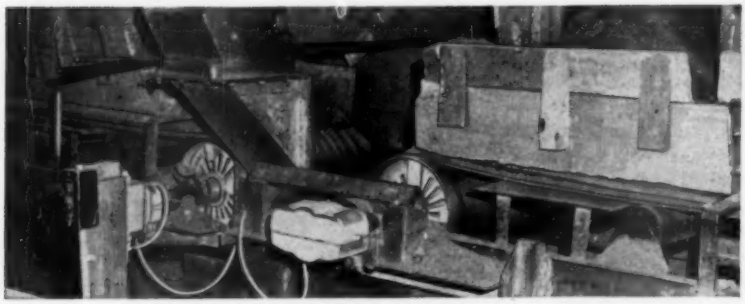



USES *Stearns* MAGNETIC PULLEYS

**POSITIVE** Here's the economical, positive way to protect expensive crushing equipment—use a STEARNS Electro-Magnetic Pulley to eliminate all tramp iron from your material. That's exactly what Anaconda Copper Mining Company is doing at their Conda, Idaho plant; two STEARNS Magnetic Pulleys remove all scrap metal from phosphate rock before crushing.

**AUTOMATIC** If you want to avoid costly damage to crushers, grinders, screens and other equipment, install a STEARNS Magnetic Pulley for continuous and automatic removal of tramp iron. Whether you are handling rock, ore, slag or crushed stone, STEARNS has EXPERIENCE ENGINEERED equipment to meet your requirements.

STEARNS offers a complete line of Electro and Permanent Magnetic Pulleys. Write today for descriptive literature.



Installed in the Crushing and Drying Plant, these two STEARNS Magnetic Pulleys are the effective answer to the tramp iron problem.

*Foremost in the Magnetic Field*

*Stearns* MAGNETIC INC.

675 South 28th Street, Milwaukee 46, Wisconsin


monly caused by excessive moisture content and inadequate venting of gases.

Other new perlite uses reported were its use by the dry cleaning industry as a filter powder for cleaning fluids, and as a filter aid in the distilling and oil refining industries. Extremely fine perlite particles, once discarded by processors as unusable are now being ground even finer for these new filtering uses.

Copies of a 126-page report on the physical properties of perlite concrete, as determined by Robert W. Hunt Co., engineers, were distributed to each of the member companies. This report makes available, for the first time, comprehensive load data for short span perlite concrete roof slabs made with a variety of different mixes. It also describes the physical properties of perlite concrete such as compressive and tensile strengths, thermal conductivity, drying rate, shrinkage, and plastic flow.

New thermal conductivity ratings for perlite plaster were also announced. Data, determined by a nationally recognized laboratory, showed the follow "k" factors for perlite plaster, measured at 75 deg. F.: scratch coat (2 cu. ft. of perlite to 100 lb. of fibered gypsum), 0.857; brown coat (3 cu. ft. of perlite to 100 lb. of fibered gypsum), 0.800. The same scratch and brown coats and a standard finish coat applied on ½-in. gypsum lath have a "k" value of 0.813. The report stated that these tests indicate that perlite-gypsum plaster provides from six to seven times the insulation value of standard plaster of the same thickness.

The ore committee reported that it is now preparing definite specifications to cover three distinct gradations of crude perlite rock which can be expanded in present-day furnaces to produce plaster and concrete aggregates conforming to Perlite Institute specifications.

## Urge Concrete Roads

COAL MINERS and operators of northern West Virginia have opened a state-wide campaign demanding that the proposed West Virginia turnpike, between Charleston and Princeton, be paved with concrete, and also that more concrete and less asphalt be used for all state roads.

Two reasons were given for this campaign—to keep coal miners at work and the operators in business, and to give West Virginia taxpayers a better return from their road-tax investment. It was pointed out that during the past two years only one concrete paving job, requiring only 26,000 bbl. of cement, has been awarded. It was also pointed out that it takes about 115 lb. of coal to make a barrel of cement and 1 lb. of coal to make 1 lb. of steel. As stated by a union official and leader of the campaign, "The use of blacktop pavements favors the oil industry."



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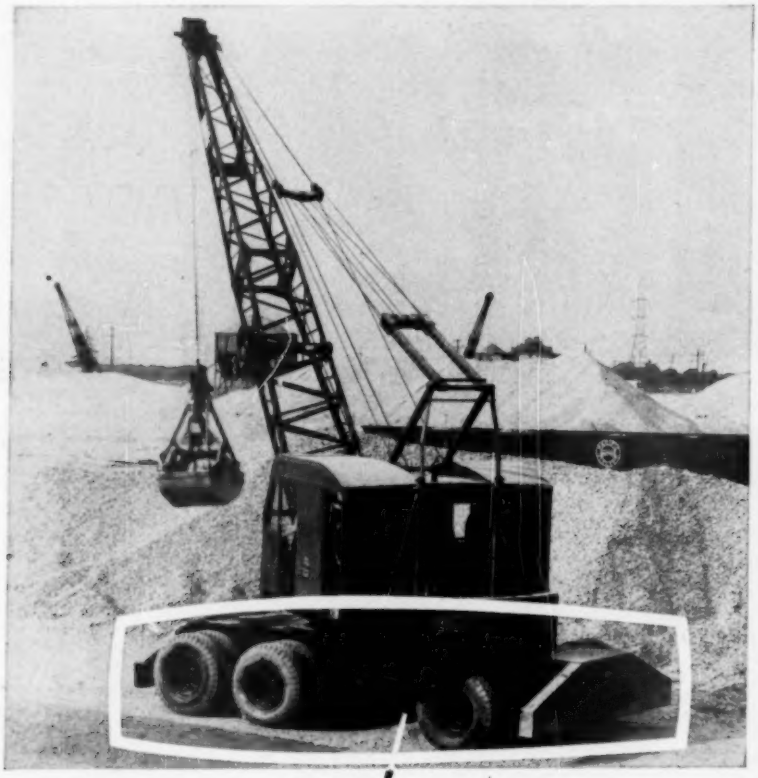

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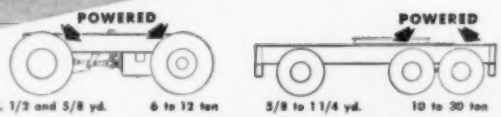


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## Rocky's Notes

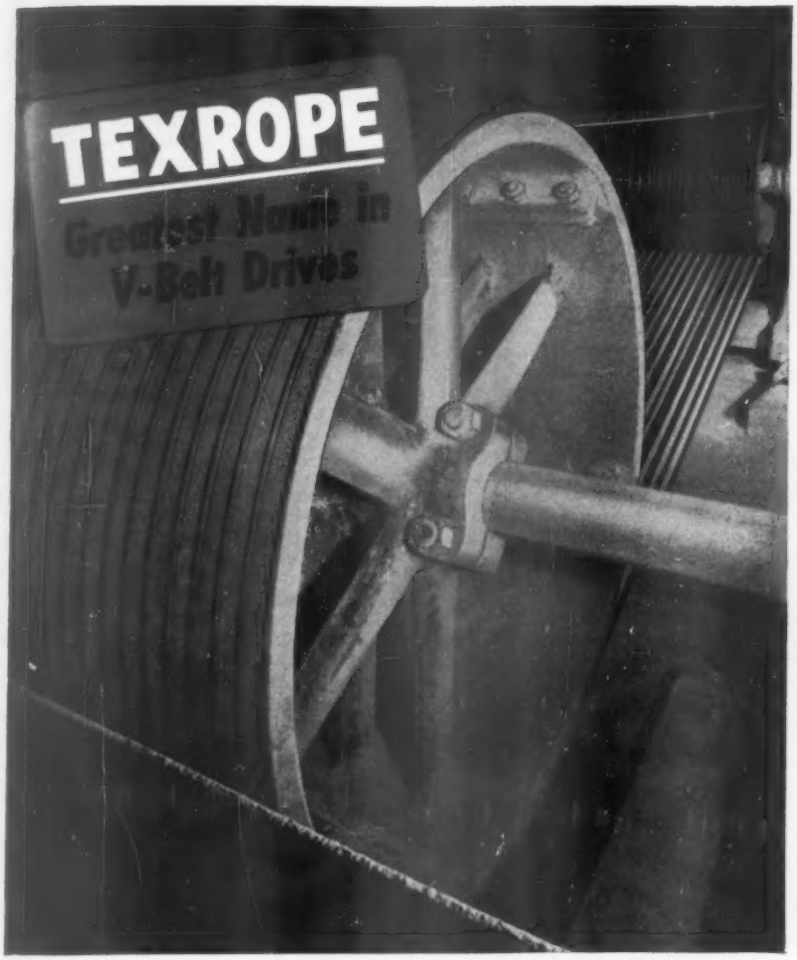
(Continued from page 69)

the case may be. If this reasoning is sound, it supplies a plausible explanation of the beneficial effects of adding an active pozzolan to a concrete made with a "high" alkali cement. It would also appear that if a high alkali cement were also a high silica cement, or a reactive silica used in generous proportion with a high alkali cement, the alkali should prove actually beneficial rather than otherwise.

We have given above only a small insight into the interesting and relevant material contained in Dr. Vail's book "Soluble Silicates—Their Properties and Uses." Volume 1 contains chapters on the history of these silicates, on present practices in their manufacture, on the homogeneous systems, on the heterogeneous systems, on complex systems. Of course, there is much of value to other than those interested in cement and concrete chemistry. For example, the reactions between calcium compounds containing water "are of interest in connection with the study of soils, fertilizers, and pharmaceutical preparations in which absorbent or antacid properties are of value. They relate to the purification of water, the action of detergents, the preparation of catalytic agents and of gels for soil consolidation, and to the reactions by which cement and coatings made from silicate solutions are rendered insoluble by treatment with calcium salts."

In the study of the effect of sodium silicate on clays it has been found that: "By simulating conditions which occur in natural clays through the addition of calcium hydroxide and calcium sulfate, striking differences were shown in the deflocculating effects of sodium hydroxide, sodium metasilicate ($Na_2O{\cdot}SiO_2$), and sodium carbonate. The sodium metasilicate was much more effective in the presence of 0.56 percent of calcium hydroxide, though minimum viscosity was reached at a higher concentration than was necessary in the pure kaolinite suspension." Since portland cement paste in many respects resembles an impure clay with an excessive amount of calcium hydroxide in solution or suspension, it would seem that certain conditions, or certain proportions of sodium silicate and calcium hydroxide, would promote excessive deflocculation, when, for best results in the concrete, the opposite effect, or flocculation, is the thing desired.

We might go on for many more paragraphs to prove, we hope, that much of the work done on soluble sodium silicates could be used in guiding research on insoluble calcium silicates. Moreover, the book we have reviewed here is another example of the kind of technical literature on structural inorganic chemistry that should never be neglected in the widespread search for the secrets of cement and concrete.



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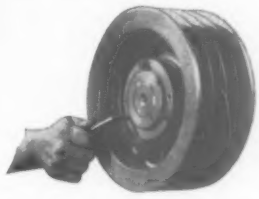

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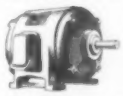

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## Labor Relations Trends

*(Continued from page 71)*

"Mr. Stevenson's criticism of the law is that it should accept labor unions as 'the responsible representative of their members' interests. What he means, and again is afraid to say, is that we must accept the demands of labor bosses without questioning whether they are really for the advantage of the union member or the public, and whether the men really approve of them. Congress prohibited the closed shop because it would thus deprive every man in this country of the right to choose his own occupation, without first getting the approval of some labor union official. It is one of the provisions of the law which protects the individual union workman as he should be protected and as no law has ever undertaken to protect him before. The closed shop is for no one's advantage, except that of the labor union official. Mr. Justice Brandeis has pointed out the danger of the power it gives a union official.

"Taft-Hartley permits the union shop if employer and union agree upon it. The modified form of union shop prescribed by the Taft-Hartley law is a fair provision protecting union membership adequately and yet protecting the individual workman, and his right to get a job, and his right to keep a job, if he pays the union dues. In other words, he can't be a free rider, but he can't lose his job because he gets into a row with the union boss.

"If the prohibition of the closed shop has resulted in 'bootleg agreements in flagrant violation of the statute' it is simply because Mr. Truman in this field, as in many others, has simply refused to enforce the law which is on the statute books. The present provision of the law is recognized as equitable by fair labor leaders as well as employers. It is the same as the law in Canada.

"It is true that we had an alternative when we were drafting the law which has some reasonable support. We could have permitted the closed shop and then regulated the union, telling every union in this country who must be admitted to the union, on what terms he could be fired, just how their elections should be conducted, all controlled in detail by federal regulation. Certainly, we could not permit both a closed shop and a closed union. I finally decided against this approach because it seemed to me to bring the federal government into a detailed bureaucratic control of unions against my philosophy of government and in the end I should think much less favorable to unions. Furthermore it really recognizes the union as a branch of government, and I don't believe that's good for the union or anyone else. The theory that unions create industrial democracy and should be a kind of subordinate government agency is certainly open to question when we see the manner in which union leaders are elected year after year with no real possibility of any opposition developing because of their arbitrary control of their machinery of election.

"It seems to me it is better to tell a union what it can and cannot do, and let it regulate its internal affairs.

"There are a number of provisions in the Taft-Hartley law which further protect the rights of individuals. Governor Stevenson talks a lot about the dignity of the individual, but no man has any dignity if his life and his job can be determined by a union official. We require that the union member be furnished with financial reports, as many responsible unions did, but some did not. We require that his contribution to his union shall not be used for political purposes, perhaps to defeat a friend whom he wished to see elected. We provide protection for union welfare funds, some of which had disappeared in the past and others been administered at the discretion of union officials, adding to their power over union members.

"The law also outlaws jurisdictional strikes and secondary boycotts. Mr. Stevenson criticizes the definition of secondary boycotts, and I agree that in some minor respects it is too broad, but we found the writing of a correct definition exceedingly difficult."

* * *

"I have come to the conclusion that many labor union officials are really against the Taft-Hartley law, contrary to their public statements, because of the prohibition of the closed shop and the secondary boycott. They do not dare to say so, and so exaggerate a lot of minor complaints. Neither of these practices ever benefited a workman, but they would give arbitrary power to labor union officials over their men. They should never be legalized."

### As to Injunctions

Senator Taft discussed at some length the arguments Governor Stevenson used against court injunctions. It is not necessary to go into that here because all employers know that under the law only the federal government has the power to request injunctions, and these only to enforce rulings of the N.L.R.B., and only when national health and safety are involved. There is no other civil way to enforce law or regulations; it is a far safer method for all concerned than government seizure. In regard to nation-wide strikes Senator Taft said: "I am quite willing to admit that the Taft-Hartley Act is no final solution to this problem, but I think we must recognize that in a democratic form of government, there can be no completely satisfactory remedy. Only a dictator can make millions of men go to work if they don't want to go to work. It has seemed to me essential that we retain the freedom to strike if we are going to have freedom in this country at all. If we recognize as a part of our basic law the government's right to prohibit strikes indefinitely by seizure and injunction, or the government's right to compel compulsory arbitration, then I think we approach the end of a free economy. If wages are to be fixed by government, we will have to fix prices and allocate materials. We will have to recognize government's right to control our whole commerce and agriculture by regulations. I don't want to see that day, and so I was opposed to putting any compulsory provisions into the Taft-Hartley law beyond the imposition of a short waiting period."

* * *

"I do not believe that there should be in our permanent law any provision for government wage-fixing because, if there is any such provision, one party or the other is almost bound to feel that it will get a better deal from government than it can from bargaining, and collective bargaining becomes a farce. Obviously, that was [the late] Mr. Murray's position in the recent steel strike in which he had apparently a very close understanding with the administration. Under some other administration, perhaps, the employers would stall negotiations hoping to get a better decision from a government board.

"The national emergency provisions of the Taft-Hartley law are not perfect; but the more I look at them, the more it seems to me that the wisdom of changes is very doubtful. There should be machinery permitting government action only when a real emergency is found by a board, as in this law. I doubt if that board should make a definite finding, but rather a full statement as to the matters at issue, as in this law. I doubt if permanent legislation ought to provide for more than preservation of the status quo for a brief period of time, as in this law. But we should certainly reexamine the whole subject.

"The question, of course, arises as to what is going to happen if the 80 days expire and no settlement is reached. I can only point out that we have had many nation-wide strikes and in some manner a settlement has been reached before any danger to the nation. If that danger faces us, then I believe Congress should pass a special law to deal with that particular strike, and no other. Such a law should be tailored for the particular situation. It might include injunction, seizure, government operation. . . . Legislation might actually fix wages, as it did in the case of the Adamson law at the beginning of the first world war. But my principal conclusion is that if you want to go further than the Taft-Hartley law in the way of compulsion . . . it ought to be by special statute, when the emergency arises, and limited to the needs of the particular situation.

"If a nation-wide strike can not be dealt with any other way, we



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might have to consider a limitation of nation-wide bargaining, to prevent monopoly in labor as in industry. But I have always regarded such a law as very difficult to draw, and I do not believe it is going to be necessary. A lot of inconvenience is justified to keep the field of collective bargaining as free as possible.

"With regard to amendments to the Taft-Hartley law there is no doubt in my mind that improvements can be made. We quite realized in 1947 that no law of this length, dealing with such diverse and complicated matters, could possibly be letter-perfect. In 1949 the Senate passed some 28 amendments to correct various matters, mostly of minor objections, alleged and legitimate, brought up by labor union officials and others. These amendments were passed by the Senate, but suppressed in the House of Representatives by the Administration and the labor unions on the ground that they must have repeal or nothing. In other words they wanted the issue in the election. They weakened, however, and this year we passed one of the 1949 amendments abolishing the necessity for an election on union-shop agreements, and the Senate passed another one authorizing unions in the building trades to make contracts in the advance of the beginning of a job. This is really a modification of the Wagner Act rather than the Taft-Hartley law, and it does not legalize the closed shop.

"Other important amendments which should be adopted include:

"1. Extension of non-Communist affidavit to employer representatives if they wish to avail themselves of the provisions of the Act.

"2. Amendment of the secondary boycott provisions both to cure inequities and to close loopholes.

"3. Removal of prohibition against voting by strikers who have been replaced, leaving the question of eligibility to the National Labor Relations Board. This is the amendment referred to by General Eisenhower as necessary to prevent the possible use of the law as a union-busting law. I think the amendment is desirable, though I think the fear is imaginary.

"4. Amendments to expedite case handling by N.L.R.B. by removal of prohibition against pre-hearing elections and hearing officers' recommendations.

"5. A redefinition of the term 'foreman' to make sure that only those are excluded from bargaining who are really a part of management.

"6. Removal of penalty against individuals who strike during the 60-day waiting period, but retaining penalties against employer and union.

"7. Clarification of relations between the General Counsel and the Board.

"8. Rewriting of the provision relating to welfare funds to provide proper supervision by the Department of Labor.

"There are other provisions which


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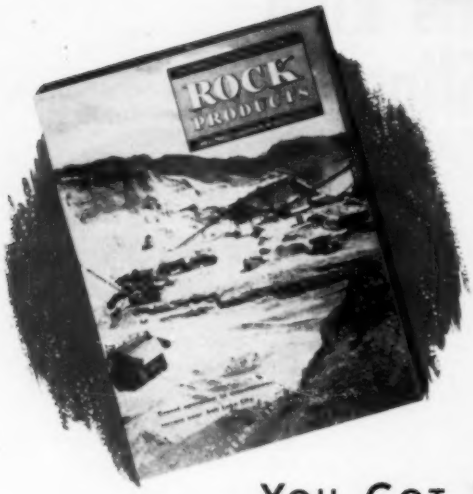


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- You were served by nine ROCK PRODUCTS editors (5 full-time and 4 on the Contributing Board) who are all qualified graduate engineers, accustomed to bringing the practical engineering approach to solution of your problems.
  Serving you in ways far removed from usual concepts of "typewriter-journalism", in 1952 these engineer-editors travelled extensively throughout the United States and in parts of Canada, Europe and South America. They visited your plants, attended scores of your conventions and meetings, and provided for you on-the-spot information in usable form.
  Six of the nine held 14 committee memberships, contributing to the work of important technical bodies such as the American Institute of Mining Engineers, American Concrete Institute, American Society for Testing Materials, American Society of Mechanical Engineers, and American Water Works Association. One is an Honorary Life Member of the National Lime Association, and an Honorary Director of both the National Sand and Gravel Association and the National Ready Mixed Concrete Association.

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- Your requests for information and quotations on manufacturers' equipment, sent on the Readers' Free Service Ad Coupon, have been passed on by us to advertisers and have resulted in them sending you many thousands of product data answers.

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- We have enjoyed visits to our Chicago editorial offices with many of you from all over the United States, and many more from Canada, South America, Western Europe, Turkey, Egypt, South Africa, Australia, New Zealand, Japan and other countries. These visits enabled us to help with discussions of your problems and get to know more of you as personal friends.



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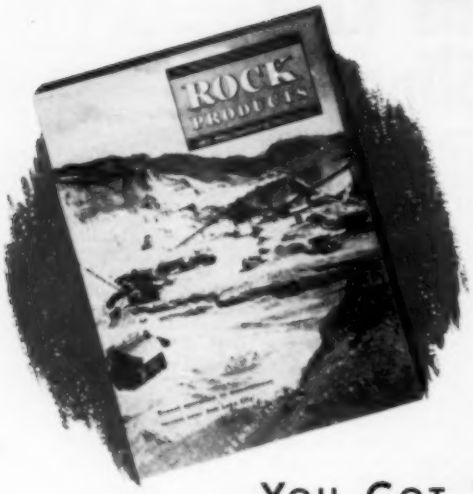


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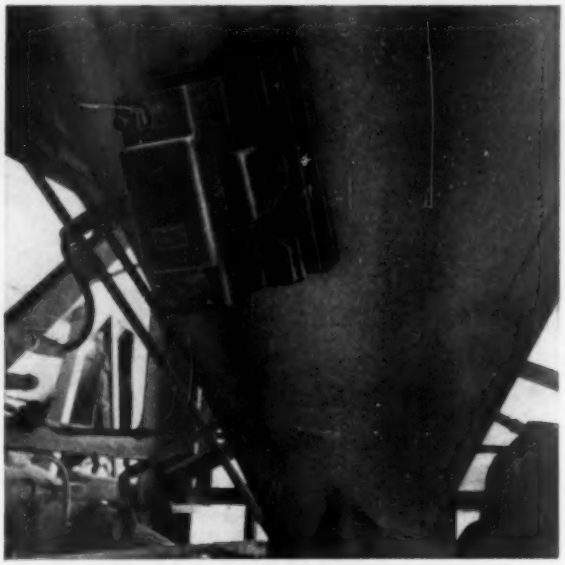

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should be considered carefully on full hearings. The important thing, however, is that the basic principles of the law be not changed.

"Those principles are the right of free and competitive collective bargaining without government dictation or wage fixing or compulsory arbitration, the right to strike except for brief waiting periods for the most part in national emergency cases, the responsibility of employer and union to carry out their contracts, prohibition of unfair labor practices on the part of both management and labor, including freedom of speech, prohibition of the closed shop, of jurisdictional strikes and of secondary boycotts, the protection of the right to work even under legalized union shop agreement as well as other individual rights of the union member. These principles are fair and necessary to protect the liberty of union, employer, union member, and the public."

### Take Citizenship Seriously!

We are sure no fair-minded reader, employer or employe, can find fault with the logic and fairness of Senator Taft's presentation. Let us all remember General Eisenhower's final message the night of his election, that he alone can not accomplish what must be accomplished if we are to restore our government to the principles on which it was founded, and for nearly a century and a half pursued by men of honor and integrity. We suggest you write to Senator Taft either agreeing with his presentation or offering constructive suggestions to be used when the Taft-Hartley law comes before Congress for revision. It also would be a good idea for you to let General Eisenhower know that you agree with Senator Taft about the law. The General is probably less familiar with the philosophy and with experience under these laws than with other phases of the domestic economy. We can all feel sure that if he is guided in these probems by Senator Taft, every one will be happier, and we include the members of labor unions, whose union bosses have grossly misrepresented both the Taft-Hartley Act and the character of Senator Taft.

## Stabilizing Soil

INTERNATIONAL MINERALS AND CHEMICAL CORP., Chicago, Ill., has utilized a process which consolidates loose land into a rock-hard foundation for industrial plants. The method is being used in construction of a multi-million dollar triple superphosphate and uranium recovery plant near Bartow, Fla. The method is a German process called Vibroflotation which has been licensed in the U.S. by Rust Engineering Co. of Pittsburgh, Penn. The process compacts the sand till it forms a solid foundation. International Minerals claims that the Vibroflotation method will result in a saving of $250,000 over an equivalent system of pilings.



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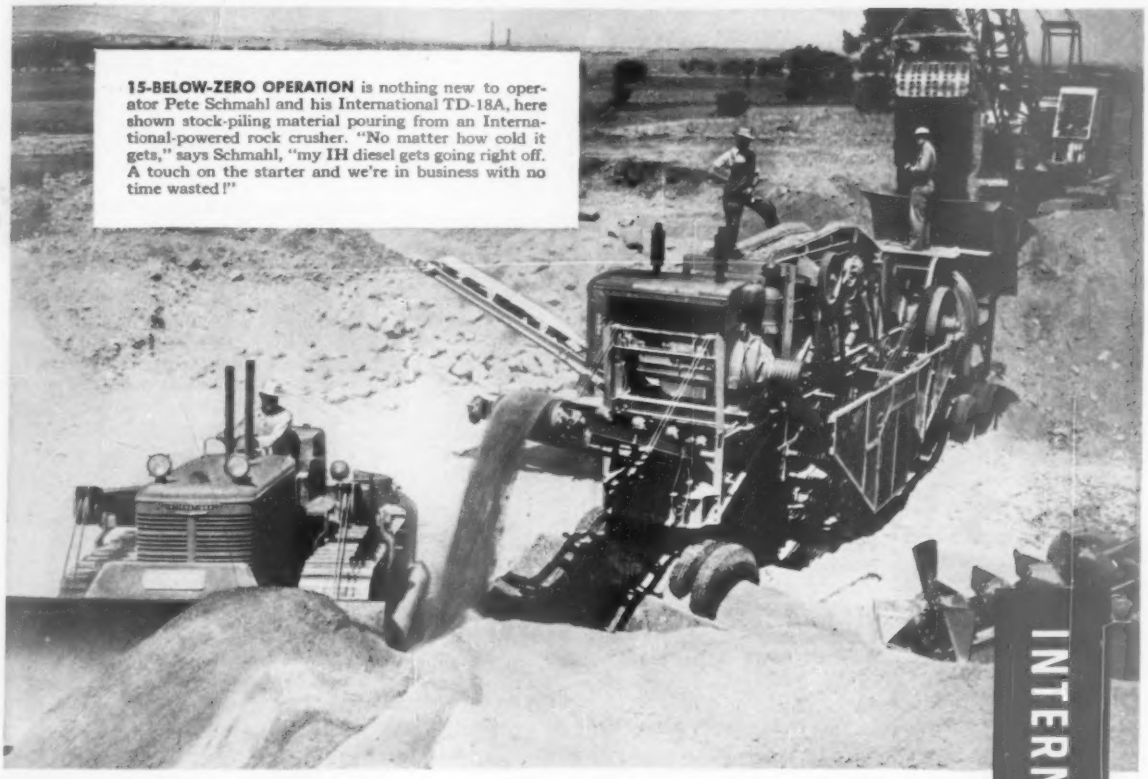
# Rocky Mountain ROCK CRUSHER



**15-BELOW-ZERO OPERATION** is nothing new to operator Pete Schmahl and his International TD-18A, here shown stock-piling material pouring from an International-powered rock crusher. "No matter how cold it gets," says Schmahl, "my IH diesel gets going right off. A touch on the starter and we're in business with no time wasted!"

## Versatile Colorado contractor finds International power pays off on every job

Colorado's Winslow Construction Company handles almost every phase of moving and processing earth and rock. They excavate, build roads, produce crushed stone, clay and sand for their own and other construction jobs.

All along the line, they rely on International crawlers and power units. For example, to supply cushion material for the new Denver-Boulder super-highway, Winslow uses a UD-18A engine to run the rock crusher, and a TD-18A crawler to stockpile finished material and push raw rock up to the dragline.

*"We've got eighteen Internationals,"* says Winslow, *"because we demand machines that give minimum operating costs and maximum work done per day. Also we get constant attention from our International Industrial Distributor. He figures his job isn't over when he makes a sale. His goal is a satisfied customer. And we're more than satisfied. We're enthusiastic!"*

Get the low-down on International machines from your distributor. Put *"Power that Pays"* to work for you!

**International Harvester Company, Chicago 1, Ill.**

INTERNATIONAL

INTERNATIONAL HARVESTER

POWER THAT PAYS

**NO!**

Here, conventional U-Bolt clips are properly applied but rope is distorted and subject to life-shortening strains under load.

**NO!**

Inexperienced workmen can easily put conventional U-Bolt clips on incorrectly with saddles not on load-line. Result: Weakened rope — risk of accidents.

## It CAN'T Go On Wrong

Both halves of the Laughlin Safety "Fist Grip"* clip are identical. There is no wrong way. The most careless workman can't put 'em on wrong (unless he forgets to tighten the nuts). And they're not only safer and practically foolproof, but they're a darn sight easier to use.

## Here's why:

Nuts are out in the open, can be tightened with any wrench, and don't have to be "inched around."

Bolt ends are shorter and don't get battered or bent. Nuts are always easy to remove when clip is to be re-used.

No crushed rope ends under "Fist-Grips" to cut off. Rope saved.

Fewer clips are required in many installations, so there is less work to do.

*"Fist-Grip"* Clips are just one example of many LAUGHLIN EXCLUSIVES in design, safety and quality that make Laughlin your best buy in wire rope and chain fittings.

*Look for the trademark* *to be sure*

**THE THOMAS LAUGHLIN COMPANY**
**128 FORE ST., PORTLAND, MAINE**

# LAUGHLIN

**THE MOST COMPLETE LINE OF WIRE ROPE AND CHAIN FITTINGS**

*Patented, T.M. Reg.


## Cement Booklet

PUBLICATION OF THE BOOKLET, "The Portland Cement Industry," written by Hubert C. Persons, former manager, Public Relations Bureau, Portland Cement Association, Chicago, Ill., was recently announced by Bellman Publishing Co., Inc., 83 Newbury St., Boston 16, Mass. The book is one of a series of 75 occupational booklets used in connection with guidance activities wherever general counseling work is conducted and for individual reference purposes in the choice of a career.

Mr. Persons is a qualified expert and his booklet was designed to supply the following authoritative, factual information: personal qualifications required for engaging in the work; scholastic training needed; complete analysis of employment opportunities; remunerations received; chances for advancement; frank statement of advantages and disadvantages; and possibilities for both men and women in the industry.

## Represents Manufacturers

RALPH S. HUNT, who is well known in the aggregates industry, has gone into business for himself at 317 McKinley Ave., Kenmore, N.Y., handling equipment for aggregates producers in western and central New York state. As manufacturer's representative, he plans to give prospective customers the benefit of his many years of experience in the industry and, where necessary, make preliminary layouts of specific jobs. The equipment Mr. Hunt is representing includes vibrating screens of Deister Machine Co.; elevators, conveyors and accessories of The Columbus Conveyor Co.; dust collecting and exhauster fans of Northern Blower Co.; electric wire cloth heaters of F. R. Hannon & Sons; and crushers and sand and gravel processing equipment of McLanahan and Stone Corp.

Ralph S. Hunt



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# users specify AMSCO DREDGE PUMPS

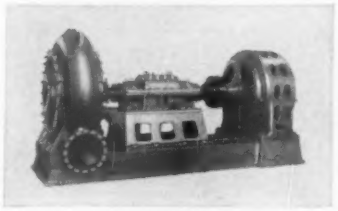
More **Amsco** Pumps have been placed in dredges for sand and gravel recovery, river and harbor dredging, shell reclamation, and more recently, ores such as titanium, than those of any other manufacturer. The reasons for this preference are clear:

**Amsco** Pumps, with working parts made of manganese steel, can withstand the terrific abrasion of sand and the sledge hammer blows of rock much longer than any others.

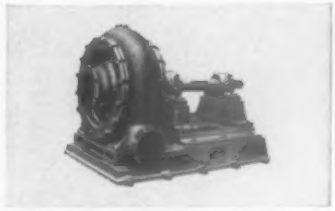
**Amsco** Pumps are designed from experience and engineered for your job.

▶These six basic types of Amsco Dredge Pumps—actually there are 40 different models—give a general idea of the complete line. The basic differences are in rated capacity, weight and construction of bearings, and in proportionate shaft sizes. Such modifications are made for economy...There is no dollar-wasting excess weight on the Amsco Pump engineered for your job. Water end parts are also available in ABK metal subject to our engineers approval.

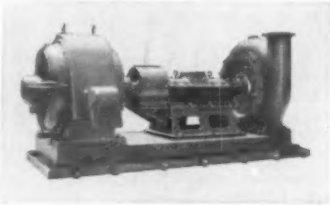
Amsco has a complete line of welding rods and electrodes to assure prolonged life and economical service of Amsco Dredge Pumps.



**16-inch type XH**—directly connected design; right hand bottom discharge. Can be fitted with "standard" or "counter-flow" water ends.

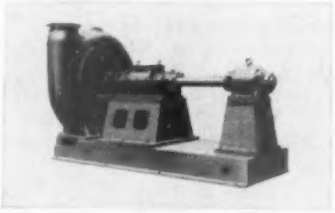


**6-inch type SB-CF**, form 24—antifriction bearing; stub base or belt driven; right hand bottom discharge.

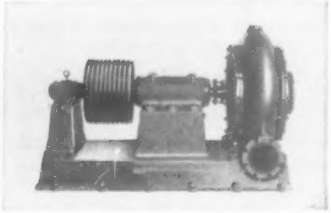


**10-inch type M**—left hand top discharge. Built in 6-, 8- and 10-inch sizes. Can be fitted with "standard" or "counter-flow" water ends.

**20-inch type XHRB-CF**—left hand bottom discharge; antifriction thrust and radial bearings.



**12-inch type H-CF**, form 40—right hand, top vertical discharge; belt driven. Combination two directional-type ball thrust bearing and sleeve-type radial bearings



**8-inch type C**, form 30—belt driven; left hand bottom discharge; combination ball thrust and ring oiling sleeve main bearings. Available with "standard" or "counter-flow" water ends.

American Brake Shoe Company

**AMERICAN MANGANESE STEEL DIVISION**
377 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.
Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

HANDLES 35% SOLIDS 4000 gpm!

In the phosphate fields of Florida, rugged "pit cars" are used to pump phosphate rock and water from the pits to the washeries and treatment plants. Each "car" is a sturdy structure that supports the pump and houses the electric motor and controls. Skids permit moving from one location to another. On board is a Morris 10-inch Heavy Duty Dredging Pump that delivers, day after day, approximately 4000 gpm of mixture with 35% phosphate rock by volume.

MORRIS

DREDGING PUMPS...

Wherever dredging operations demand a pump that provides longer service . . . less maintenance . . . more economical operation . . . there you'll find a Morris. For every Morris Dredging Pump is scientifically designed around certain field-tested features that guarantee better performance . . . features such as:

**Heavy pump shaft**—to transmit maximum power . . . withstand sudden stresses . . . prevent destructive whipping.

**Oil-lubricated anti-friction bearings**—to preserve correct and rigid alignment of the shaft . . . provide quieter operation.

**Rigid structural steel frame**—to further maintain alignment . . . reduce vibration.

**Axial adjustment**—to permit restoration of required clearances in only a few minutes.

**Interchangeable parts**—to enable substitution of vital pump parts of different alloys to compensate for changes in corrosive or abrasive action of materials handled.

**Modern design**—to provide high efficiency . . . reduce initial investment and operating costs.

**FREE SERVICE** Morris Dredging Pumps are built in standard, medium duty, and extra heavy types, in sizes from 4-inch to 48-inch, with electric motor, steam, Diesel or gasoline engine, or for belt, chain or gear drive. At no obligation on your part, Morris Engineers will be glad to study your needs and recommend the pump best suited for your purposes. Send in the necessary data today.

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Sales offices in principal cities

MORRIS CENTRIFUGAL PUMPS


## Limestone Mine Warehouse

A LIMESTONE MINE near Bonner Springs, Kan., has been converted into what is claimed to be the world's largest underground warehouse, containing 500,000 sq. ft. of floor space, or 9,000,000 cu. ft. of storage room.

The site of the new warehouse is located on the main line of the Union Pacific Railroad, 16 miles west of Kansas City, Kan. The project was engineered by E. P. Conlan, vice-president, Natural Storage Co., Inc., and was constructed by Loring Quarries, Inc., Loring, Kan., a company formed in 1947 by Guy E. Stanley, Jr., president of Natural Storage Co., and E. P. Conlan.

The storage area has been divided into rooms with temperatures ranging from minus 10 deg. F. to plus 55 deg. F. Approximately 6,000,000 cu. ft. of the storage area will be at a 55 deg. temperature, the natural temperature of the cave, leaving 3,000,000 cu. ft. to be refrigerated. The cave was adapted similarly to one at Atchison, Kan., owned and operated by the government.

## Canadian Cement Shortage

AN ACUTE CEMENT SHORTAGE, which is seriously curtailing construction projects, has been reported in Winnipeg, Manitoba, and other Canadian areas. Canadian cement has been in short supply since last spring. Defense projects are consuming about 75 percent of the available supply, with industrial and highway construction consuming most of the remaining supply. U.S. imports have also been inadequate to meet the demand.

## Pacific Mineral Resources

U.S. BUREAU OF MINES has issued a report containing a complete inventory of the industrial mineral resources of the Pacific Northwest States—Oregon, Washington, Idaho and Montana.

The report gives the location, by states and counties, of deposits of each of the following mineral commodities: abrasives (garnet, corundum and silica), asbestos, barite, bauxite, cement materials (including brick and tile), clay, diatomaceous earth, feldspar, fluorspar, gem materials, graphite, gypsum, limestone, magnesium minerals, mica, mineral wool, peat, phosphate rock, quartz crystal, refractories, sand and gravel, stone, talc and vermiculite.

The report gives the characteristics of each mineral and lists its principal commercial uses. Commodities that have a large, localized market predominate in the report. These include portland cement, sand and gravel, stone, clay and lime.

A free copy of this Information Circular 7641, "Industrial Minerals of the Pacific Northwest," may be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Penn.



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# "Our Whites pay off 3 ways"

**Reports Ralph H. Anderson, President, W. E. Anderson Sons Co., Columbus, Ohio**

**R. H. ANDERSON's** progressive company has a fleet of 50 Whites that hauls 3 tons per minute, travels more than 2½ million miles a year from their ready-mixed plants and 8 batcher plants in Central Ohio.

**RUGGED WHITE DUMP TRUCKS** . . . busy White concrete mixers . . . stockpiling White tandem dump trailers . . . all give W. E. Anderson Company, Columbus, Ohio, the real lowdown on White performance and economy. And 25 years with Whites in their fleet confirm their report.

"Whites pay off in these three ways:" President R. H. Anderson says.

✔ **"LONGER LIFE**—we roll up the miles in our fleet and Whites consistently keep our maintenance costs low.

✔ **"MORE PAYLOAD**—we're going to larger payloads constantly and Whites have the design and the power to do it efficiently.

✔ **"DRIVERS PREFER WHITES**—take pride in their trucks and take better care of them because they know Whites stand up on tight schedules, heavy loads and hard trips. They help our safety program."

Find out how Whites can help your business. See your White Representative for facts.

**THE WHITE MOTOR COMPANY**
**Cleveland 1, Ohio**

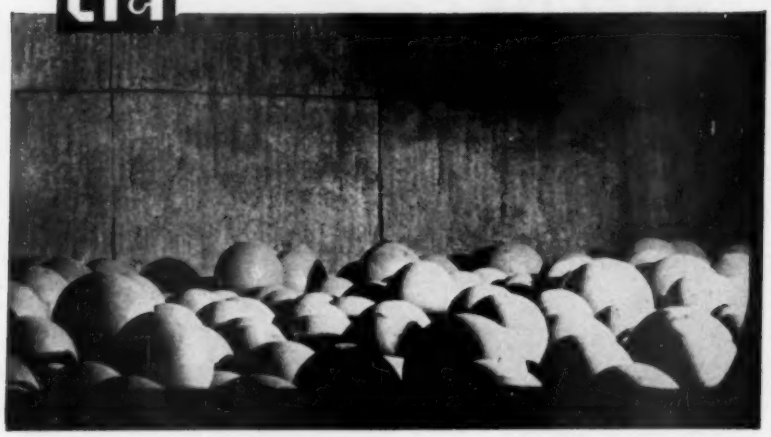
## MUSTANGS PAY OFF!

White Mustang Engines went into action for W. E. Anderson Co. on 24-hour stockpiling operation handling 22,000 lb. loads. Wonderful power reserve, low maintenance cost, and an extra mile-per-gallon of gasoline.

White

*For more than 50 years the greatest name in trucks*

CF&I STEEL PRODUCTS FOR THE MINING INDUSTRY



# FORGED STEEL GRINDING BALLS

CF&I Grinding Balls are forged from special analysis steel to impart the high impact and abrasion resistance that enables them to wear evenly and remain spherical.

The assistance of CF&I metallurgists and engineers is always available to help solve any grinding problem. Perhaps they can help you increase production or lower operating costs.

*CF&I Products for the Mining Industry*

**Cal-Wic Wire Cloth Screens • Mine Rails and Accessories • Rock Bolts**
**Wickwire Rope • Grinding Balls • Grinding Rods**

THE CALIFORNIA WIRE CLOTH CORPORATION, OAKLAND
THE COLORADO FUEL AND IRON CORPORATION, DENVER and NEW YORK

CF&I FORGED STEEL GRINDING BALLS
THE COLORADO FUEL AND IRON CORPORATION

1135

## FINANCIAL

RECENT DIVIDENDS

| | | |
|---|---|---|
| Alpha Portland Cement Co. | $1.50 | Dec. 10 |
| American Rock Wool Corp.—Q | $0.20 | Sept. 10 |
| Arundel Corp.—Q | 0.30 | Oct. 1 |
| Basic Refractories, Inc.—Q | 0.25 | Sept. 30 |
| Basic Refractories, Inc.—pf.—Q | 1.43¾ | Oct. 1 |
| Bessemer Limestone & Cement Co.—Q | 0.50 | Oct. 1 |
| Bessemer Limestone & Cement Co.—pf.—Q | 0.50 | Oct. 1 |
| Blue Diamond Corp.—Q | 0.15 | Sept. 15 |
| Canada Cement Co., Ltd. | 2.00 | Nov. 29 |
| Consolidated Cement Corp.—Cl.A. stk | 1.05 | Sept. 30 |
| Diamond Portland Cement Co. | 0.30 | Sept. 10 |
| Dragon Cement Co., Inc.—Q | 0.40 | Sept. 13 |
| General Portland Cement Co. | 0.50 | Sept. 30 |
| Giant Portland Cement Co.—stk | 2% | Oct. 1 |
| Ideal Cement Co.—Q | 0.50 | Sept. 30 |
| Lehigh Portland Cement Co.—Q | 0.30 | Dec. 1 |
| Lone Star Cement Corp.—Q | 0.35 | Sept. 26 |
| Marquette Cement Mfg. Co. | 0.20 | Sept. 5 |
| Medusa Portland Cement Co. | 0.60 | Oct. 1 |
| National Gypsum Co.—Q | 0.35 | Oct. 1 |
| Nazareth Cement Co.—Q | 0.25 | Sept. 15 |
| Northwestern Portland Cement Co.—1st pf. | 1.50 | Sept. 20 |
| Pacific Coast Aggregates, Inc. | 0.10 | Sept. 18 |
| Pacific Coast Aggregates, Inc.—pf.—Q | 1.12½ | Oct. 15 |
| Pennsylvania Glass Sand Corp.—Q | 0.30 | Oct. 1 |
| Pennsylvania Glass Sand Corp.—pf.—Q | 1.25 | Oct. 1 |
| Riverside Cement Co.—cl. A—Ac. | 0.50 | Oct. 15 |
| Superior Portland Cement, Inc. | 0.25 | Sept. 10 |
| United States Gypsum Co.—Q | 1.00 | Oct. 1 |
| United States Gypsum Co.—pf.—Q | 1.75 | Oct. 1 |
| United States Gypsum Co.—E | 1.50 | Oct. 1 |
| Warner Co.—Q | .0.40 | Oct. 15 |

FOOTE MINERAL CO., Philadelphia, Penn., has reported a net profit of $167,119, or $0.62 per common share on 260,496 shares and $119.71 per pfd. share on 1396 shares, for the first six months of 1952. This compares with a net profit of $312,001, or $1.20 per common share on 257,872 shares and $223.50 per pfd. share on 1396 shares, for the first six months of 1951. Net sales for the first half of 1952 amounted to $3,990,133, compared with $3,964,765 for the same period of the previous year.

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., has reported the following account of income for the nine months ended September 30:

| | 1952 | 1951 |
|---|---|---|
| Sales | $41,473,919 | $39,387,993 |
| Net before taxes | 11,061,431 | 11,446,938 |
| Federal income taxes | 6,377,000 | 7,230,000 |
| Net profit | 4,684,431 | 4,216,938 |
| Earned per share | $2.46 | $2.22 |
| No. capital shares | 1,901,560 | 1,901,560 |

ALPHA PORTLAND CEMENT CO., Easton, Penn., for the years ended September 30, gives the following statement of earnings:

| | 1952 | 1951 |
|---|---|---|
| Net sales | $24,946,998 | $24,528,600 |
| Costs & exp. | 17,864,208 | 16,456,147 |
| Depree. & deplet. | 885,299 | 764,164 |
| Operating profit | 6,197,491 | 7,308,289 |
| Other income, net | 131,405 | 133,811 |
| Total income | 6,328,896 | 7,442,100 |
| Federal income tax | 3,231,136 | 3,563,907 |
| Excess profits tax | 593,652 | 954,526 |
| Net profit | 2,504,108 | 2,923,667 |
| Prev. surplus | 10,370,277 | 9,383,565 |
| Common dividends | 1,760,868 | 1,936,955 |
| Surplus, 9-30 | 11,113,517 | 10,370,277 |
| Earn. per com. share | $4.27 | $4.98 |
| No. of com. shares | 586,956 | 586,956 |

CALIFORNIA PORTLAND CEMENT CO., Los Angeles, Calif., lists a net income of $2,996,594, or $6.20 per share on

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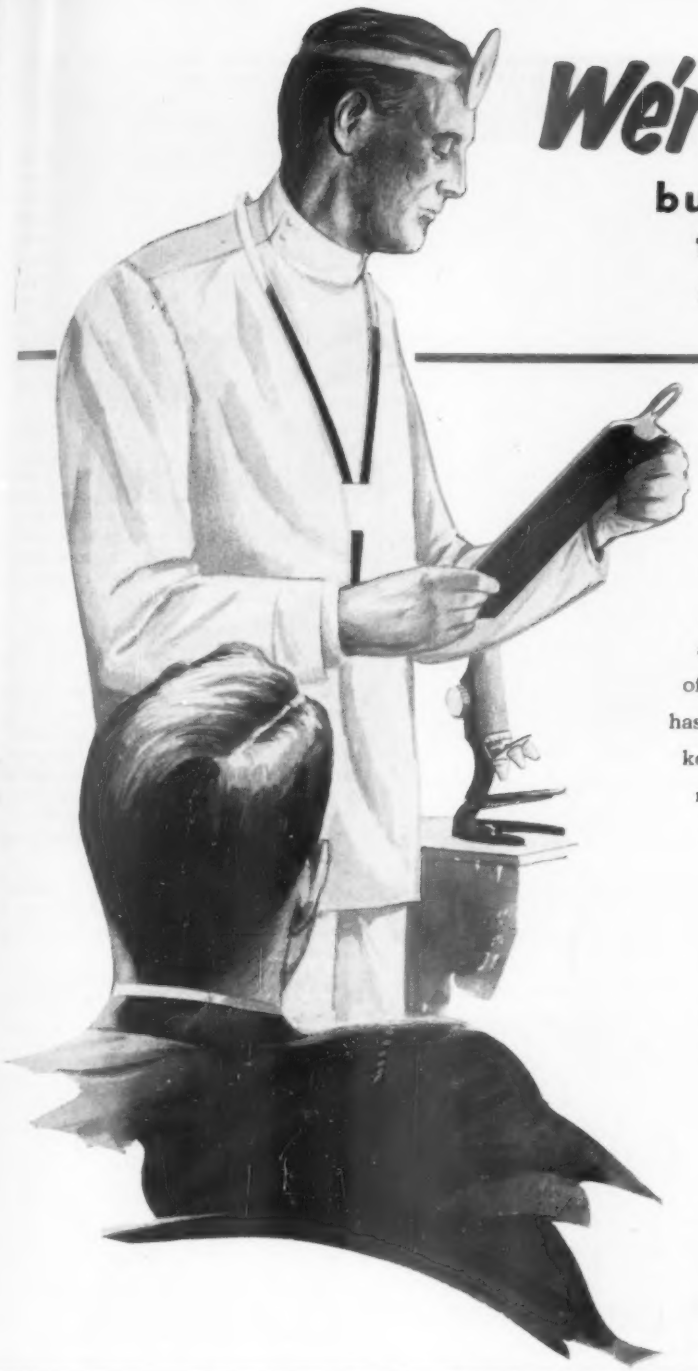


# We're not MD's

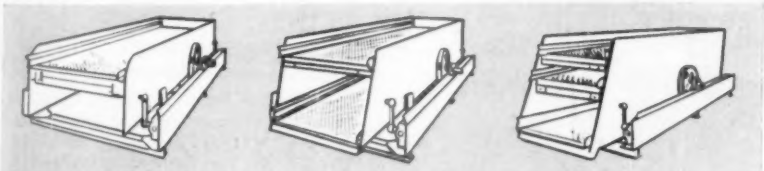
## but we can prescribe the answer to your screening problems

Whether your screening involves fine or coarse materials, or both: whether you want to make one size or ten . . . you can have a "healthy," trouble-free screening operation with Seco on your job! Here is why! First, you get the advantages of Seco engineering and construction proved in use on thousands of tough screening assignments. *Only* Seco has fully controlled true circular action, the key to better tonnages, accurate sizing and minimum maintenance. Second, but equally important, you get the personal interest and attention of screening specialists. This means you'll get the right screen or screens to meet *your* exact requirements. Don't put up with a tired, sickly screening setup any longer. Call in Seco screening specialists now. Write, wire or phone.

**SECO**

**TRUE CIRCULAR ACTION**

**VIBRATING SCREENS**



SINGLE DECK | DOUBLE DECK | TRIPLE DECK

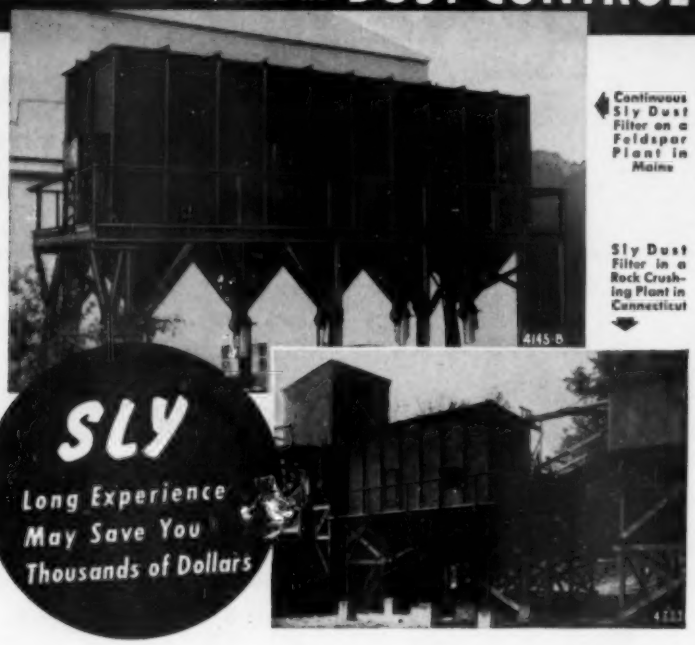
*Over 350 single, double and triple deck models*

*Makers of Vibrating Screens Exclusively*

**SCREEN EQUIPMENT Co. Inc.**
1750 Walden Ave.
Buffalo 25, N. Y.

In Canada: United Steel Corp.
Toronto, Ontario

PIONEERS and LEADERS IN **DUST CONTROL**



Continuous Sly Dust Filter on a Feldspar Plant in Maine

Sly Dust Filter in a Rock Crushing Plant in Connecticut

**SLY**

Long Experience May Save You Thousands of Dollars

Many years of experience and numerous operating installations IN YOUR PARTICULAR INDUSTRY make Sly the outstanding organization to engineer your dust problem.

The know-how of dust collection cannot be found in print. It has been acquired by Sly through experience with thousands of installations for generations.

A note from you will bring you our text book bulletin or, if you wish, a Sly engineer to help lay out and specify suitable equipment.

Sly units are not expensive; they save thousands of dollars yearly in plant maintenance and improved production.

**THE W. W. SLY MANUFACTURING CO.**

4746 TRAIN AVENUE CLEVELAND 2, OHIO

New York • Chicago • Philadelphia • Syracuse • Detroit • Buffalo
Cincinnati • St. Louis • Indianapolis • Birmingham • Los Angeles • Toronto



**Slurries...handled at lower cost**

The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

A. R. WILFLEY & SONS, Inc.
Denver, Colo., U.S.A.
New York Office: 1775 Broadway, N.Y.C.

Buy WILFLEY for Cost-Saving Performance

WILFLEY centrifugal PUMPS

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS


483,150 shares, for the year ended April 30, 1952. This compares with a net income of $4,024,316, or $8.33 per share, for the preceding year.

BLUE DIAMOND CORP., Los Angeles, Calif., lists a net profit of $416,319 for the first six months of 1952, compared with a net profit of $557,026 for the same six months of the preceding year. Earnings per common share for the 1952 period amounted to $0.57 per share on 729,313 shares, as against $0.76 per share for the 1951 period. Net sales totaled $5,891,403 for the first six months of 1952 and $7,691,900 for the same period of the previous year.

BASIC REFRACTORIES, INC., Cleveland, Ohio, for the six months ending June 30, 1952, lists a net profit of $181,177, as against a net profit of $260,106 for the same period in 1951. Net sales amounted to $5,524,599 for the first half of 1952, compared with $6,182,863 for the corresponding six months of 1951.

COLONIAL SAND & STONE CO., INC., New York, N.Y., for the first six months of 1952, has reported a net profit of $289,160, or $0.37 per common share on 775,000 shares. This compares with a net profit of $289,297, or $0.37 per share, for the corresponding six months of the previous year. Net sales amounted to $10,489,399 for the first six months of 1952, and $10,016,626 for the first half of 1951.

INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago, Ill., for the years ended June 30, reports the following statement of earnings:

| | 1952 | 1951 |
|---|---|---|
| Net sales | $84,570,447 | $66,257,884 |
| Cost of sales | 62,228,619 | 46,926,289 |
| Selling, etc., exp. | 9,041,637 | 6,521,423 |
| Deprec. and deplet. | 3,366,302 | 2,832,399 |
| Operating profit | 9,933,889 | 9,977,773 |
| Other income | 160,313 | 77,301 |
| Total income | 10,094,202 | 10,055,074 |
| Interest | 415,951 | 415,944 |
| Federal income tax | 2,925,000 | 2,825,000 |
| Excess profits tax | ..... | 200,000 |
| Other income taxes | 100,000 | 100,000 |
| Net income | 6,653,251 | 6,514,130 |
| Prev. earn. surp. | 21,893,816 | 18,806,630 |
| Preferred divs. | 393,320 | 393,320 |
| Common divs. | 3,389,987 | 3,033,624 |
| Earned surplus, 6-30 | 24,763,760 | 21,893,816 |
| Times pfd. divs. | 16.91 | 16.56 |
| Earned pfd. share | $67.66 | $66.25 |
| No. of pfd. shares | 98,330 | 98,330 |
| Earned com. shares | $2.90 | $3.06 |
| No. of com. shares | 2,161,511 | 2,000,000 |

PERMANENTE CEMENT CO., Oakland, Calif., reports the following earnings for the six months ended July 31:

| | 1952 | 1951 |
|---|---|---|
| Net sales | $12,332,566 | $10,488,306 |
| Net before taxes | 4,029,397 | 3,230,395 |
| Federal income taxes | 2,388,498 | 1,776,448 |
| Net income | 1,640,899 | 1,453,947 |
| Earned per share | $1.17 | $1.04 |
| Number of shares | 1,400,000 | 1,400,000 |

ALBERENE STONE CORP. of Virginia, Schuyler, Va., reports a net income of $2570 or $0.04 per share on 65,745 shares, for the first nine months of 1952, compared with a net income of $55,278, or $0.84 per share, for the corresponding months of the previous year. Net sales for the first nine months of 1952 totaled $1,375,108, as against $1,429,365 for the same period in 1951.



UNIVERSITY OF MICHIGAN LIBRARIES

# ONE STAGE BULLDOG HAMMERMILL

NON-CLOG MOVING BREAKER PLATE

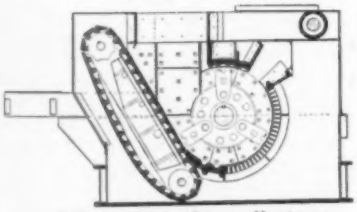
# 7 CARLOADS

(PARTIAL SHIPMENT FOR ONE CUSTOMER)

# BULLDOG HAMMERMILLS

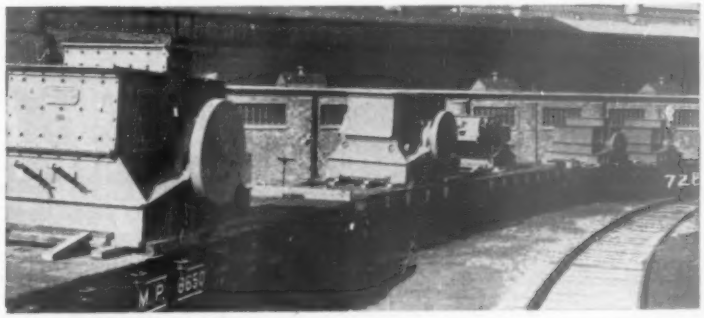
[PRIMARY - SECONDARY - FINE REDUCTION]

**BULLDOG HAMMERMILLS for DRY OR WET STICKY MATERIALS FOR THOSE TOUGH HEAVY-DUTY CRUSHING JOBS 1 to 1000 ton capacity**



**Ask for List of Installations**

ASK FOR LIST OF INSTALLATIONS



*We will gladly survey your reduction requirements and recommend the proper equipment without cost or obligation. Just write or call.*

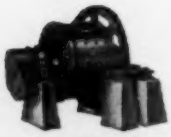
**HAMMERMILLS, INC.**
4766 W. Division St.
Chicago 51, Illinois

*division of*

**PETTIBONE MULLIKEN CORP.**
Phone SPaulding 2-9300

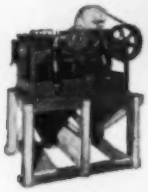
Denver-Dillon Vibrating Screens

Denver Ore Feeders



Denver Steel-Head Ball Mills

Denver Disc Filters



Denver Selective Mineral Jigs

Denver SRL Pumps

Denver-Buckman Concentrators

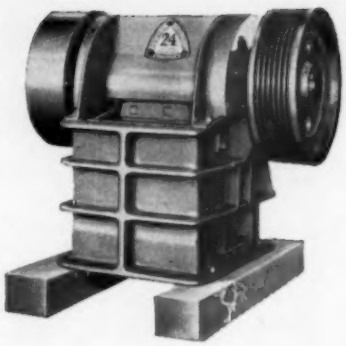
Denver Mechanical Gold Pan

**DENVER FORCED FEED Jaw Crushers**

***Sizes:***

*(Type "H"—anti-friction bumper bearings, bronze side bearings.)*

| | |
|---|---|
| 2¼" x 3½" | 8" x 10" |
| 3¼" x 4½" | 10" x 16" |
| 5" x 6" | 10" x 20" |



***Sizes:***

*(Type "J"—anti-friction bearing crusher.)*

| | |
|---|---|
| 10" x 24" | 18" x 36" |
| 10" x 36" | 21" x 36" |
| 15" x 24" | 21" x 40" |
| 15" x 36" | 25" x 40" |
| 18" x 24" | 32" x 40" |

***Specifications:*** Cast steel or fabricated steel frame. Cast steel bumper. 13%-14% Manganese steel jaws and cheek plates. Forced Feed crushing action. Safety toggle of cast iron protects against tramp iron.

*Illustrated bulletin sent on request. Write today.*

Please write to us about your requirements. Quantity production of standard equipment means lower cost and good deliveries • Complete mill equipment from testing to feeder to dryer.

**Denver "Sub-A"**—for 25 years the greatest name in **Flotation Engineering.**

***Many of our machines are in stock.***

FLOTATION ENGINEERS

*"The firm that makes its friends happier, healthier, and wealthier"*

DENVER EQUIPMENT COMPANY

P.O. BOX 5268 • DENVER 17, COLORADO

DENVER • NEW YORK CITY • CHICAGO • EL PASO • TORONTO • VANCOUVER • MEXICO D.F. • LONDON • JOHANNESBURG

**forged** ***STEEL DROP BALLS***

***FOR ECONOMICAL SECONDARY BREAKAGE***

Prices and information on request

Available 2000 to 8000 lbs.

**CAPE ANN ANCHOR & FORGE CO.**

P.O. BOX 360, Gloucester, Mass.


## NEW INCORPORATIONS

**Milford Block and Tile Co.,** Milford, Iowa, has been incorporated with $50,000. Officers of the company include C. F. Gosch, president; N. C. Rindsig, vice-president; and Marvin E. Simonson, secretary-treasurer. The plant will produce precast concrete products.

**Arrow Transit Mix Concrete Co.,** Yuma, Ariz., was recently incorporated by Homer Henson and Walter Norton.

**Light Aggregates, Inc.,** Rapid City, S.D., was recently incorporated with a capitalization of $100,000. Directors of the new firm are R. E. Lemley, M. B. Christie, Ralph R. Basler, R. E. Driscoll and P. R. Quarnberg, all of Rapid City.

**Idaho Bartile Co.,** Pocatello, Idaho, recently filed articles of incorporation, listing capitalization at $75,000. Dale V. Thompson, Salt Lake City, Utah; Clifford Cook and Victor M. Thompson, Boise, Idaho, are the directors of the new firm.

**Sheboygan County Lime & Gravel Corp.,** Plymouth, Wis., was recently incorporated with 1000 shares of stock, $25 par value. Minimum capital was listed at $500. The incorporators are Arthur Matzdorf, Alfred Bassuener and Henry Blanke.

**Lakeland Concrete Block Co.,** Cleveland, Ohio, has been incorporated by Frank H. Feingold with 250 shares no par value common stock.

**Liberty Stone Quarries, Inc.,** Bertram, Texas has been granted a 50-year corporation charter. Capital stock was listed at $14,200. The incorporators are F. F. Davis, M. M. Bonnett and J. T. Sites.

**Pike County Sand & Gravel Co.,** Waverly, Ohio, was recently formed by D. W. Riddle and N. J. Wenzel. The company owns pits above Omega and near Jasper, Ohio.

**Midwest Foundry Sand & Materials Co., Inc.,** Milwaukee, Wis., has been incorporated with 100 shares of stock, no par value, and a minimum capital of $500. Samuel Weitzen is the incorporator.

**Shawnee Limestone Co.,** Topeka, Kan., has been incorporated to produce crushed stone.

**Evertru Products, Inc.,** Spokane, Wash., was recently incorporated with a listed capital of $100,000. The principal incorporators are Donald W. Walters and Carl B. Warren. The company will deal in concrete products.

**Mesa Sand & Rock Co.,** Mesa, Ariz., has been incorporated by Martin Sirrine, O. B. Shill and V. R. Sanderson.

**Waco Ready Mix Concrete, Inc.,** Waco, Texas, has been incorporated by Edwin D. Neelley, Willie Mae Neelley and Stanley C. Morris. Capital stock was listed at $50,000.



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JAMES WARD
Says-
WARD GRAVEL CO.
MINERS OF
Washed Sand and Gravel
PLANTS: BLUFF SPRINGS AND MIDWAY, FLA.
FLOMATON, ALA.
Sept. 19, 1952
Thomas Foundries
Birmingham
Alabama.
Dear Sirs:
Please quote us a price on another Thomas Pump Series FL, exactly like the one we bought nearly two years ago.
Also quote us on an eight inch with ten inch suction.
Sand and gravel outfits that don't use Thomas Dredge Pumps don't know what they are missing. Your pump puts out more material for the same size and power, and under the same conditions, than any pump we have ever used.
Then, the life of your parts is remarkably long and upkeep costs are low. Maybe the most important feature of all is your over-night service on repair parts. Your quick shipments save us money and many worries. This means a lot to us.
Please quote us as soon as possible. We are anxious to replace one of another make and get rid of some more troubles.
Sincerely yours,
Ward Gravel Co.
By: James E. Ward Owner
JEW
MW

## "SAND and GRAVEL OUTFITS WITHOUT THOMAS DREDGE PUMP Don't Know What They're Missing!"

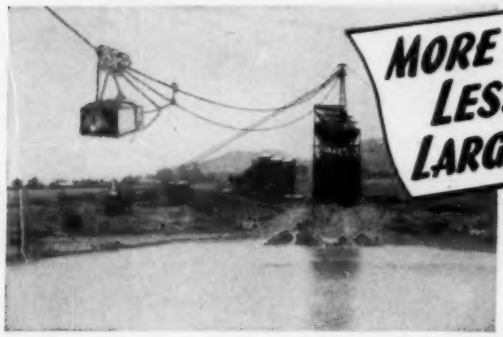
### *HERE ARE HIS REASONS*

1. "MORE PRODUCTION"
2. "LOWER UPKEEP COSTS"
3. "LONG PARTS LIFE"
4. "OVERNIGHT SHIPMENT OF PARTS"
5. "LESS DOWN-TIME"
6. "SAVE MONEY AND SAVE WORRY"

Ward Gravel Company Plant in Operation

**IF YOU DO IT WITH SAND & GRAVEL PUMPS, YOU CAN DO IT BETTER WITH A "THOMAS"**

If you are interested in lower sand-and-gravel production costs, write for literature on Thomas Durable Dredge Pumps. Address THOMAS FOUNDRIES, INC., Birmingham, Alabama.



MORE YARDAGE LESS LABOR LARGER PROFITS

Here is a Sauerman Slackline Cableway supplying a screening plant with 225 tons of gravel an hour. Pit is 900' long, 400' wide, 100' deep.

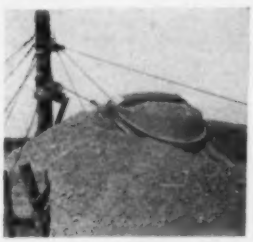
# SAUERMAN method . . .

## *Simplifies Material Handling!*

At hundreds of sand and gravel plants, rock processing plants, cement mills, etc., where there are problems of long range excavating or stockpiling, Sauerman Drag Scrapers and Slackline Cableways constantly prove their ability to handle large yardages at low cost.

A Sauerman machine reaches across a river, down into a pit, up to the top of a hill or across a wide stockpile — moves material from any point within its radius, and dumps automatically wherever required. One-man control, fast action. Power requirement is moderate. Maintenance is easy; a few expendable parts take all the wear.

Whether your project is large or small, there is a size and type of Sauerman machine suited to your requirements — a machine that will give you years of steady service at minimum expense, no matter how tough the work it is called upon to do.



Sauerman Scraper Delivering Gravel to Hopper.

Sauerman Scraper Stores and Reclaims Crushing Plant's Surplus Output.

● *Write us about your interests and we will send illustrated catalog by return mail.*

Rope Haulage Equipment Specialists Since 1909

**SAUERMAN BROS., Inc.**

530 S. Clinton St., Chicago 7, Ill.

**BUCKET LADDER DREDGES for SAND—GRAVEL**

**MONAZITE—RARE EARTHS**

**SCREEN PLATES—BUCKET PINS**

SAND PUMPS — YUBA JIGS

**YUBA MANUFACTURING CO.**

Room 717, 351 California St., San Francisco 4, California, U. S. A.

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CABLES: YUBAMAN, SAN FRANCISCO · SHAWDARBCO, LONDON


ROCK PRODUCTS FEATURES TIMELY INDUSTRY NEWS EACH ISSUE

## MANUFACTURERS NEWS

**H. K. Porter Co., Inc.**, Pittsburgh, Penn., announces that Jackson Kemper has been appointed general manager of the Watson-Stillman fittings division, Roselle, N.J.

**The Euclid Road Machinery Co.**, Cleveland, Ohio, has announced opening of a service training school for representatives of equipment distributors, customers and others who may be interested. Courses will be conducted from November to early spring, each course lasting one week.

**Gardner-Denver Co.**, Quincy, Ill., announces that A. H. Jones, director of the export division, recently returned from an extensive tour through Venezuela, Puerto Rico and Cuba, and that Gifford V. Leece, executive vice-president in charge of sales, has left for Lima, Peru, for a trip throughout the western area of South America. As a result of observations made during his trip, Mr. Jones predicts that export business to South America will be good throughout 1953.

**Morris Machine Works**, Baldwinsville, N.Y., has announced the appointment of W. M. Mercer as sales manager. He succeeds William H. Pfarrer, who recently became head of the Chicago office. Mr. Mercer, a graduate of the University of Michigan, joined the company in 1936. Two years later, he left Morris to become associated with Ramsay Pump & Supply Co. In 1942 he enlisted in the Coast Guard, serving for three years, and then joined the Solvay Process Co. He returned to Morris Machine Works in 1949 as a member of the sales department.

W. M. Mercer

**Galion Allsteel Body Co.**, Galion, Ohio, has announced the appointment of Ray W. Warren as southeast special representative. His territory includes Virginia, North Carolina, South Carolina, Georgia and Florida, with headquarters in Raleigh, N.C.

**Compressed Air and Gas Institute**, Cleveland, Ohio, was recently presented the Award of Merit by the American Trade Association Executives of Washington, D.C., "for its excellent services to its industry and especially for its education program centered on the schools of engineering throughout the United States and on the trade and technical press."

**Oliver United Filters, Inc.**, New York, N.Y., announces the appointment of Dwight Richards as director of engineering.

**Allis-Chalmers Mfg. Co.**, Milwaukee, Wis., has announced the appointment of Robert L. Halsted, formerly manager of the Cleveland district office, as manager of the central region,



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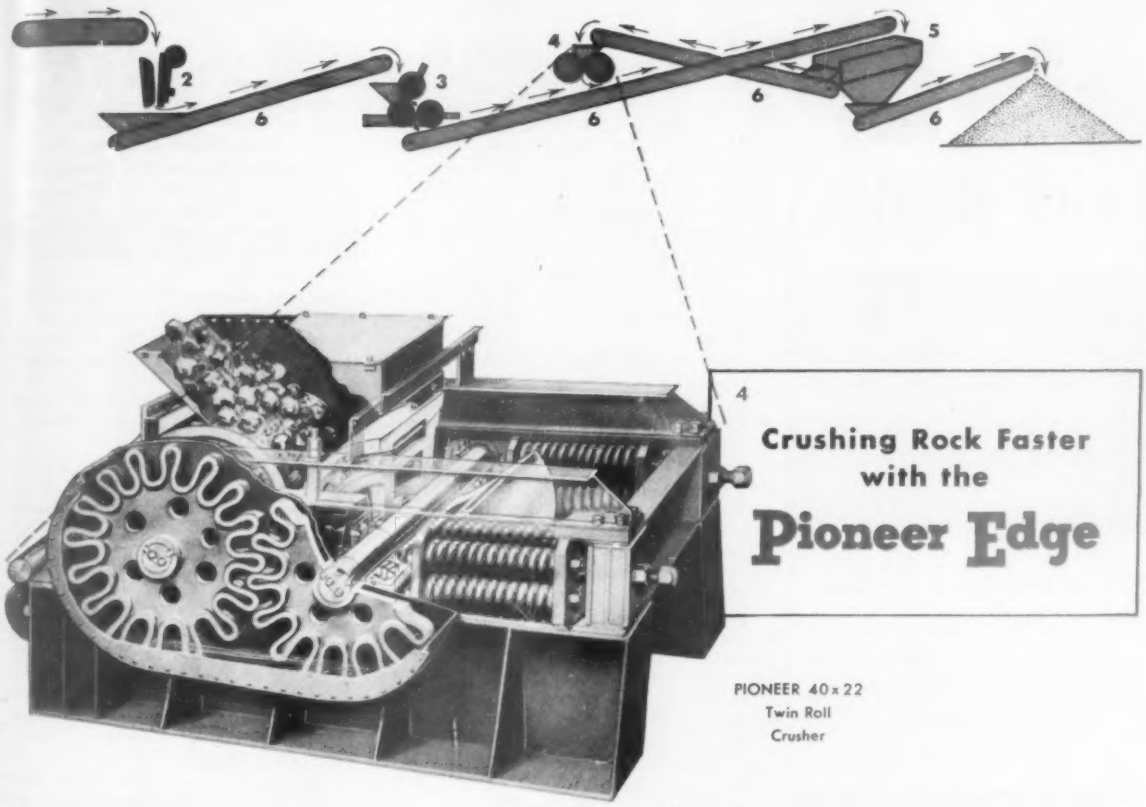



4

## Crushing Rock Faster with the Pioneer Edge

PIONEER 40 x 22
Twin Roll
Crusher

# Meet the champ of reduction crushers!

**YOU** can't beat a roll crusher for secondary and tertiary crushing!

As long as stage of reduction doesn't exceed recommended limits, these crushers turn out *more* material and cost less to operate and maintain than any other crusher of similar weight and price. Also, their product is more uniform and contains fewer fines.

Roll crushers offer a lot more advantages, too. They permit a wide range of adjustment, and make it easy to meet "tough" specifications. They require less power to crush a ton of material to a given size. They don't clog. Crusher shells are on the outside, easy to change. Lighter weight of the crusher not only means lower initial cost, but easier installation.

These advantages, plus a number of exclusive features, make the PIONEER Twin Roll Crusher the most economical, most efficient reduction crusher on the market today ... another instance of how the famous PIONEER EDGE in performance is bringing extra profits to PIONEER users.

### IMPORTANT PIONEER FEATURES

1. 100% of shell surface is used for crushing. No uneven wear, no built-up edges.
2. Easy-to-replace crusher shells available with smooth or corrugated surfaces.
3. PIONEER-developed star gears of chrome molybdenum steel outlast chain drives at least 10:1.
4. Safety springs allow passage of uncrushable objects without damage to crusher.
5. Cast-steel hubs on larger crushers provide better seating for roll shells, lessen shaft strain and roll wear.
6. Timken tapered bearings in self-aligning blocks support large diameter special-alloy shafts. Bearing span on shaft is minimum.
7. Long-lived manganese steel cheek-plates line side of crusher. Easy to adjust ... easy to replace.

### SPECIFICATIONS

| PIONEER Twin Roll Crushers | Model 24x16 | Model 30x18 | Model 40x22 | Model 50x24 |
|---|---|---|---|---|
| Max. stage of reduction* (in.) | 1¼ | 2 | 3 | 4 |
| Max. size of feed (in.) | 3½x3½ | 4½x4½ | 6x6 | 8x8 |
| Cap. in tph** (Max. size of product: 1") | 32 | 66 | 95 | 128 |
| Recommended horsepower | 55 | 75 | 100 | *125 |
| Approximate weight (lbs.) | 8500 | 11000 | 20000 | 38000 |

*Based on use of coarse corrugated shells on each roll of three larger crushers, fine corrugated shells on 24 x 16.
**Capacity may vary ± 25%, depending on type of material.

BUY BOTH! HIGHER OUTPUT LOWER UPKEEP

**Pioneer** *Continuflo* EQUIPMENT

**Pioneer Engineering Works, Inc.,** 1515 Central Ave., Minneapolis 13, Minn.
Subsidiary of Poor & Company • Chicago
Please send information on equipment checked.

- ☐ GRAVEL PLANTS
- ☐ ROCK PLANTS
- ☐ JAW CRUSHERS
- ☐ ROLL CRUSHERS
- ☐ WASHING PLANTS
- ☐ BITUMINOUS PLANTS
- ☐ APRON FEEDERS
- ☐ ORO FEEDERS
- ☐ MECHANICAL FEEDERS
- ☐ VIBRATING SCREENS
- ☐ BUZZER SCREENS (LIGHT DUTY)
- ☐ CONTINUFLO CONVEYORS

*Name*_____
*Company*_____
*Address*_____
*City*_____ *Zone*___ *State*_____

# You're Sure with Merrick

FOR Positive Controlled Feed by Weight of Sand Gravel, Lime Clinker, Gypsum or other materials to Process—

*Use the Feedoweight*

**Merrick Scale Mfg. Co.**
**Passaic, New Jersey**


with headquarters in Cleveland, Ohio. He succeeds P. F. Bauer, recently named general manager of the Norwood, Ohio, works, and manager of the apparatus department. Joseph Bronaugh, manager of the Miami office, succeeds Mr. Halsted as manager of the Cleveland district office.

**Davey Compressor Co.**, Kent, Ohio, has announced the appointment of Andrew V. Chandler as mideastern regional manager for eastern New York, New Jersey and eastern Pennsylvania.

**Truckstell Mfg. Co.**, Cleveland, Ohio, has announced the appointment of the following regional sales managers: Raymond L. Page, West Coast; C. F. Weeks, Midwest, and James M. Brown, East Coast.

**Gar Wood Industries, Inc.**, Wayne, Mich., has appointed Jack A. Reinhofer as manager of the Chicago branch. He was formerly in charge of sales for Lindsay Structure, Inc., Skokie, Ill.

**Hyster Co.**, Portland, Ore., has transferred the industrial truck sales and service departments of the Eastern division to Danville, Ill. The new sales organization covers 40 states east of the Rockies and the eastern part of Canada.

**International Paper Co.**, New York, N.Y., has appointed D. H. Kennedy as western sales manager of the southern kraft division, to succeed the late Raymond Bee. J. D. Dooley has been named assistant western sales manager of kraft linerboard sales, and N. P. Sparkman has been made assistant western sales manager of kraft paper and bag sales.

**Caterpillar Tractor Co.**, Peoria, Ill., announces that Jerry G. Wilson has been named engine sales supervisor in the sales development division. He was formerly a special representative in the division.

**General Electric Co.**, Schenectady, N.Y., has announced construction of a new service shop and warehouse in Philadelphia, Penn., to serve eastern Pennsylvania, Delaware and southern New Jersey. The new structure is scheduled to go into operation in August, 1953.

**Cummins Engine Co., Inc.**, Columbus, Ind., announces that C. B. Foster has been appointed sales manager of engines, in addition to the duties of manager of engine sales. Formerly manager of contract sales, Mr. Foster will continue to be in charge of all government contract work. He joined the company in 1950 as national accounts representative, first at Chicago and later in Columbus. In 1951 he was appointed manager of contract sales. Prior to joining Cummins, Mr. Foster was assistant to the operating vice-president of the Truax-Traer Coal Co. Previously he was assistant to the vice-president in charge of sales of Bucyrus-Erie Co.

C. B. Foster

**The Euclid Road Machinery Co.**, Cleveland, Ohio, has appointed the Philpott Equipment Co., Seattle, Wash., as distributor for the western half of Washington State and Alaska, consisting of all counties west of and including Whatcom, Skagit, Chelan, Kittitas, and Yakima with the exception of the southern counties of Klickitat, Skamania, Cowlitz, Clark and Wahkiakum.

**Westinghouse Air Brake Co.**, Wilmerding, Penn., has announced the purchase of a majority interest in Le Roi Co., manufacturer of engines, portable compressors and rock drills.

**Stoody Co.**, Whittier, Calif., has appointed the following distributors: Hampton Roads Welders Supply Co., Norfolk, Va., covering the southeast portion of Virginia; The Milliken Co., Roanoke, Va., in the western and central portions of Virginia and the north central section of North Carolina; Welders Supply Corp., Richmond, Va., covering the north central portion of Virginia; Bashlor-Sowers Welding Service, Inc., Bluefield, W. Va., in the western tip of Virgina and McDowell and Mercer counties in West Virginia; and Virginia Welding Supply Co., Charleston, W. Va., covering the south portion of West Vir-

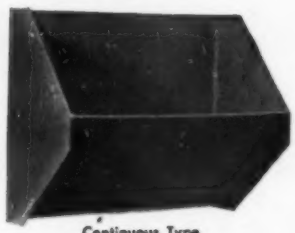
... **KNOCK-OUT!**

***High Material Handling Costs***

**Specify Super-Service**

**STANDARD**

**STEEL ELEVATOR BUCKETS**



Continuous Type
(Style No. 2 shown)

Salem Type

Write Today. You will approve our Prices and our Service

STANDARD Steel Buckets "stand up like champions" in resisting abrasion and corrosion.

Rigidly built of top-grade steel. Reinforcing strip may be welded to bucket lip, and hard surface rod added, to insure extra service life.

High-economy STANDARD Buckets are available in all styles, types, sizes and gauges.

We are equipped to furnish new units or recondition present equipment at minimum cost.

**STANDARD METAL MFG. CO. Malinta, Ohio**

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# Dry Rolling Toggle

## with Rockin' Chair Motion

**A-1 Jaw Crushers**

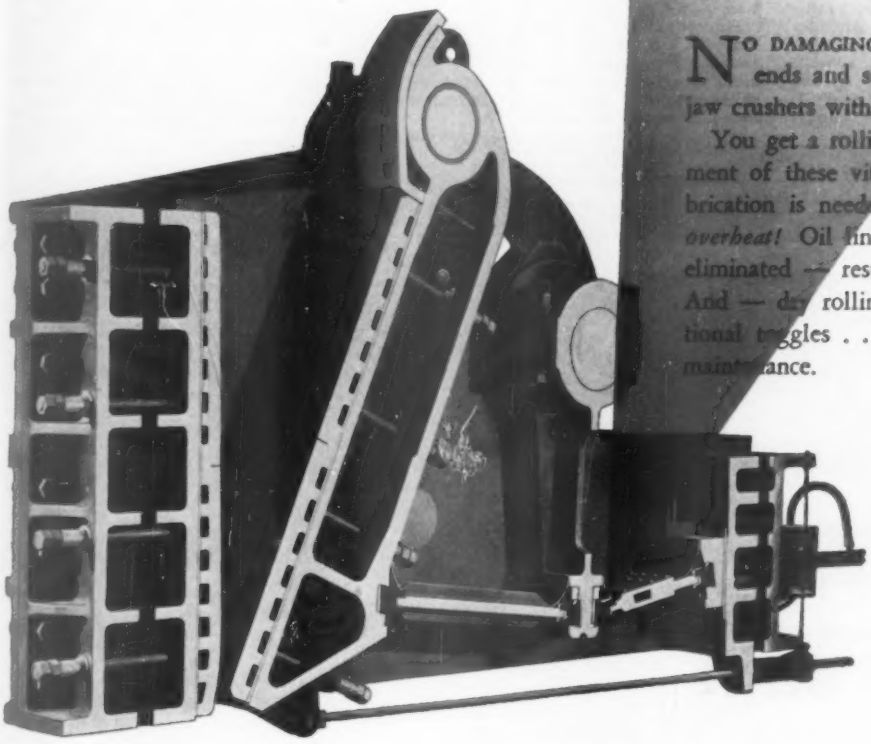
**Reduces Maintenance and Downtime**

**No Lubrication Needed**

NO DAMAGING sliding action of toggle ends and seats when you equip your jaw crushers with dry rolling toggles!

You get a rolling, "rocking chair" movement of these vital moving parts. No lubrication is needed, yet toggle ends *never overheat!* Oil lines and messy oil drip are eliminated — resulting in increased safety. And — dry rolling toggles outlast conventional toggles . . . operate with reduced maintenance.

A-3738



You can easily make your jaw crusher operations *more profitable* with dry rolling toggles. Call the A-C representative in your area, or write Allis-Chalmers, Milwaukee 1, Wis.

*A-1* is an Allis-Chalmers trademark.

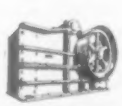
# ALLIS-CHALMERS

A-C ALLIS-CHALMERS

**Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.**

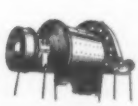
Hammermills

Vibrating Screens



Jaw Crushers

Gyratory Crushers



Grinding Mills

Kilns, Coolers, Dryers

**Eliminate 70% to 90% of Conveyor Downtime**

Cedarapids
Built by IOWA
Schrock
MOTORIZED HEAD PULLEYS
eliminate maintenance on chains, belts, sprockets, Universal drives, countershafts, etc.

U.S. Pat. No. 3548399—Others Pending

***EVERYTHING is contained INSIDE the pulley shell!***

HERE'S a money-saving departure from conventional conveyor drives. A Cedarapids-Schrock *Motorized* Head Pulley is simply a new application of the long-proven gear reduction drive, with everything . . . electric motor, reduction gears and all moving parts . . . contained inside the drum, completely protected from grit, dirt and weather and with no outside parts or motors to service. 70% to 90% of conveyor trouble and downtime is saved by eliminating the exposed parts necessary with conventional pulley drives. In operation, the pulley shell rotates about the electric motor which is held stationary by a torque arm attached to the conveyor frame. The speed of the shell depends on the combined reduction ratio of the pinions and gears inside the shell. Compact, easy-to-install, job-proved Motorized Head Pulleys are available in sizes from 5 to 30 HP and in various widths.

Find out all the advantages of converting your belt conveyor or belt-bucket elevator installations to *motorized* efficiency before you need head pulley replacements. See your distributor today, or write for Bulletin MP-1.

**IOWA MANUFACTURING COMPANY**
Cedar Rapids, Iowa, U.S.A.

Built for sale in Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah and Washington by
**YUBA MANUFACTURING CO.**
(Pulley and Sprocket Department)
Benicia, Calif.

FOR LONGER-LASTING RESULTS QUICKLY ACHIEVED...
**Repoint**
WORN SHOVEL and DIPPER TEETH

with . . .

**MANGANAL**

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11% — 13½% MANGANESE-NICKEL STEEL
**WEDGE BARS**

**LASTING RESULTS** — Manganal Wedge Bars are made of the toughest metal known . . . work-hardens to 550 Brinell . . . minimizes impact and abrasive wear . . . outlast new teeth.

**QUICKLY ACHIEVED** — Worn teeth repointed with Manganal Wedge Bars almost eliminate build-up time.

**INEXPENSIVE** - Longer-lasting results combined with speed of application make Manganal Wedge Bars your best buy.

**FREE**
Literature on latest methods for speedy and economical repair of worn equipment.

NEAREST DISTRIBUTOR UPON REQUEST

**STULZ-SICKLES CO.**
SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.


ginia, the counties of Boyd and Greenup in Kentucky and counties of Scioto and Lawrence in Ohio.

**American Brake Shoe Co.**, New York, N.Y., announces the election of Kempton Dunn as first vice-president of the company. William B. Jordan has been named treasurer, and Robert Watts and Owen B. Cottle, assistant treasurers.

**Koehring Co.**, Milwaukee, Wis., has announced the appointment of John S. Conway as vice-president in charge of sales. He succeeds Julien R. Steelman who was recently named president. Mr. Conway was formerly general sales manager and will be succeeded in this position by John E. Chadwick who has returned after serving for a year as western sales manager at Kwik-Mix Co., a subsidiary in Port Washington, Wis. Previously he had been assistant sales manager.

John E. Chadwick

John S. Conway

**Boston Woven Hose & Rubber Co.**, Cambridge, Mass., has announced the appointment of H. S. Johnson as director of merchandising. L. M. Atwood has been named assistant general sales manager and J. H. Alsen has been made director of engineering applications.

**The W. W. Sly Mfg. Co.**, Cleveland, Ohio, has announced the election of Carl R. Sare as vice-president of dust filter sales. Formerly assistant to the president of the Patterson Foundry & Machine Co., East Liverpool, Ohio, Mr. Sare attended the University of Pittsburgh and Penn State Extension College. Previously he was associated with Jones & Laughlin Steel Corp. Directors of the company in addition to President Klatt include Mrs. Marie Sly, Walter J. Carey, John L. Pischke, and Isaac Stickney.

Carl R. Sare

**Chase Bag Co.**, Chicago, Ill., has opened a new sales office in Richmond, Va., and has appointed J. A. White as supervisor of sales in the Virginia-Carolina area.

**Gardner-Denver Co.**, Quincy, Ill., has announced the appointment of Robert G. Caldwell as district manager of the branch office in Atlanta, Ga. He succeeds H. G. Little, who has bought an interest in the Central Machinery Co., Miami, Fla., a Gardner-Denver distributor.



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# Built for a Long Grind

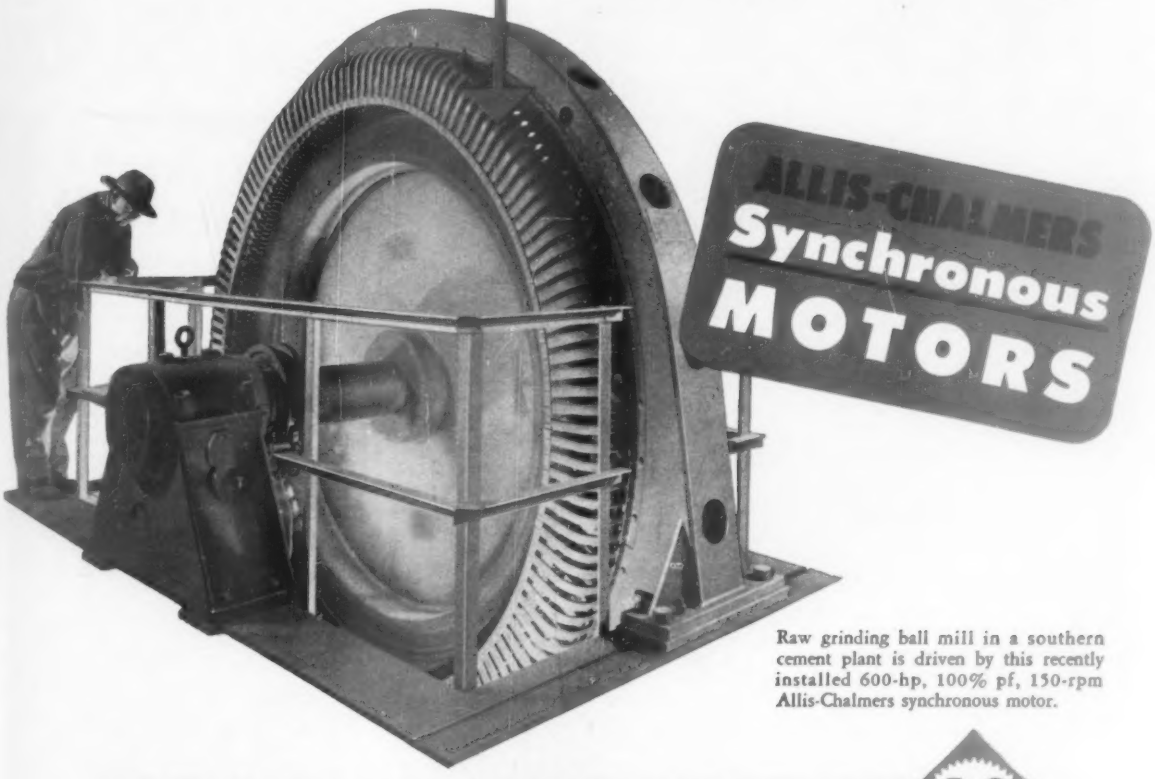
*Here are three reasons why Allis-Chalmers grinding mill motors help keep your mill grinding economically year after year:*

**Each motor** is engineered for its job. A-C's half century of experience building electrical equipment *and* processing machinery assures torque and power factor characteristics tailored to the individual installation requirements.

**Time-proved** basic design features contribute to long life and trouble-free operation. These are described in Bulletin 05B7648.

**Adequate** manufacturing, inspection and testing facilities insure that each motor will be built exactly as specified.

For more information on motors that minimize maintenance and downtime, call in your A-C representative, or write for illustrated Bulletin 05B7648. Allis-Chalmers, Milwaukee 1, Wisconsin. A-3852




Raw grinding ball mill in a southern cement plant is driven by this recently installed 600-hp, 100% pf, 150-rpm Allis-Chalmers synchronous motor.

**ALLIS-CHALMERS** A-C ALLIS-CHALMERS

# POWER to SPARE

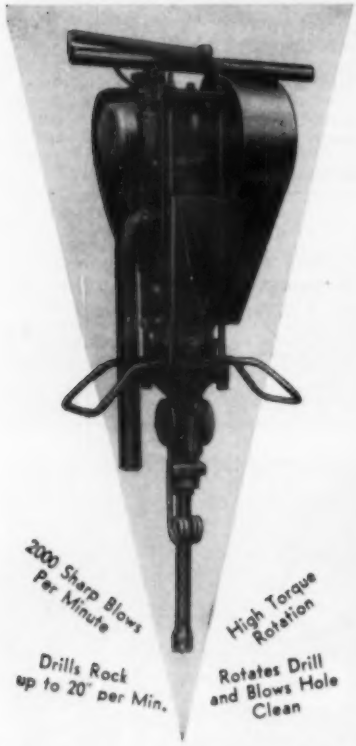
with

*SYNTRON*

**Gasoline Hammer**

*100% Self-Contained*

# ROCK DRILLS




The quick, standard insertion of drill steels and bit — a flip of the starting rope — easy, accurate spotting of work while the engine idles and the tool remains still — electric-governor control of surplus power assuring fast drilling and eliminating stalls — completely automatic and through cleaning of holes of 18" to 24" depth to prevent jamming of drill steel and bit — these are just a few of the features of the new RD-51 Rock Drill that permits efficient operation by any unskilled workman.

No Air Compressor and Hose
No Battery Box and Cable
No Springs

***Write For Free Illustrated Folder***

**SYNTRON CO.**
450 Lexington Ave. Homer City, Pa.


**Pioneer Engineering Works,** Minneapolis, Minn., announces the appointment of J. Miller Brown as export manager. He was formerly sales engineer in the southwestern states.

**Lull Mfg. Co.,** Minneapolis, Minn., has announced the appointment of Charles Strauch as sales promotion manager. Mr. Strauch joined the engineering department of the company in 1945, and has been advertising manager since 1948. He was formerly associated with Minneapolis-Moline Co. In his new position, Mr. Strauch will direct sales promotion activities of the company, including preparation of dealers' sales aids for promoting the sales of Shoveloaders, Traveloaders, Tractor-Shoveloaders and Sweepers.

Charles Strauch

**Fruehauf Trailer Co.,** Detroit, Mich., has announced the appointment of David Lewis as sales manager and assistant to C. L. Schneider, vice-president in charge of sales. He was formerly general sales manager for Lycoming-Spencer divisions of Avco Mfg. Co.

**Chase Bag Co.,** Chicago, Ill., has announced the appointment of Edson E. Foster as advertising and sales promotion manager. He was formerly associated with the Illinois Bell Telephone Co. Ralph Farnham, formerly manager of the Orlando branch, has been appointed southern promotion manager, with headquarters in Orlando, and James F. Floyd, who has been manager of the Orlando office, has been made a salesman in the Orlando district. Mr. Farnham has been with the company since 1934, and prior to his assignment as Orlando manager in 1944, served as salesman in the New Orleans area. Mr. Floyd has been with the Chase organization since 1946.

Edson E. Foster

**Olin Industries, Inc.,** East Alton, Ill., announces that Clinton L. Whiteemore, Jr., of St. Louis, Mo., has joined the administrative staff as a special representative on all activities of the company. He was formerly marketing assistant of Socony Vacuum Oil Co., Inc., Lubrite Division.

**Raybestos-Manhattan, Inc.,** Passaic, N.J., announces the death on September 29 of William H. Dunn, retired treasurer and director. He was 69 years old. Mr. Dunn joined the company in 1916 as comptroller. He became a member of the executive committee in 1937 and a member of the board of directors in 1939. He retired as treasurer and a director in 1950.

**H. K. Porter Co., Inc.,** Pittsburgh, Penn., has announced the appointment of M. B. Beline as director of national accounts, Quaker Rubber Corp., Philadelphia, Penn.

**Sterling Engine Co.,** Buffalo, N.Y., announces that George D. Thomas, formerly vice-president of Sinex Projects, Inc., has joined the application engineering field sales staff of the company, with headquarters in New York, N.Y.

**American Wheelabrator & Equipment Corp.,** Mishawaka, Ind., has appointed George W. Roper as assistant technical director of the dust and fume control division. He was formerly a project engineer.

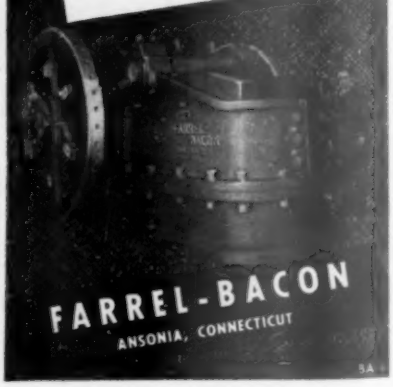
**Air Reduction Sales Co.,** New York, N.Y., has announced the appointment of A. S. Blodget, Jr., as manager of the Pittsburgh district. He was formerly manager of the Boston district and will be succeeded in this position by E. S. Twining, Jr., formerly assistant sales manager of the Philadelphia district. These changes were made following the death of S. D. Edsall, former manager of the Pittsburgh district.

**Dart Truck Co.,** Kansas City, Mo., announces that Robert L. Wicker has been appointed assistant general manager. He was previously general manager and vice-president of the Wicker-Wood Equipment Co., Los Angeles, Calif.


# FARREL-BACON JAW CRUSHERS

**SIZES 60"x48" to 10"x7"**

Optional design features include: (1) Meehanite frame, sectionalized when necessary; (2) removable water-cooled bearings; (3) improved design of swing-jaw bearing; (4) force-feed oil lubrication, or circulating system if desired; (5) split flywheels; (6) flat or V-belt drive. *Write for further details or engineering assistance.*



**FARREL-BACON**
ANSONIA, CONNECTICUT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GM DIESEL CASE HISTORY No. 5012-7

**USER:** The John T. Dyer Quarry Co., Birdsboro, Pa., producers of trap rock.

**INSTALLATION:** GM 4-71 Diesels powering 11 Koehring Dumptors. Six purchased in 1946, three more in 1948 and two in 1950. Dumptors gradually replaced railroad as quarry deepened and haul grades became too steep.

**PERFORMANCE:** Dumptors keep crusher operating at peak capacity 10 hours a day. Easily negotiate 7% grade with 7½-ton load on 1400' haul. Engines have operated dependably with time out only for normal maintenance.

# THIS DIESEL GETS UP GRADES FASTER

## ...and keeps coming back for more

"One GM Diesel leads to another." That's what many owners say when talking about GM Diesel performance. For General Motors Diesel engines are built to get more work done at lower cost. Two-cycle operation gives them faster acceleration, better grade-climbing ability, quicker response under load. Blower scavenging permits high altitude operation with maximum efficiency. Simplified design puts accessories where they are easy to inspect and service. Volume production and interchangeability insure lower cost parts, minimum maintenance expense. Check it with GM Diesel owners. Then specify GM Diesel power for your equipment. You will find that—

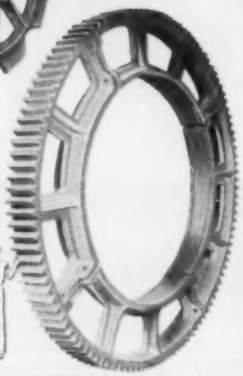
*It pays to Standardize on*

GM
GENERAL MOTORS
DIESEL
POWER

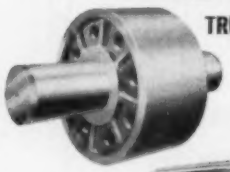
DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN

ALWAYS SPECIFY
Stroh
WEAR-RESISTANT
Replacement Parts
for
Kilns Rod Mills Compeb Mills
Coolers Tube Mills Crushers
Dryers Ball Mills Classifiers
other similar equipment

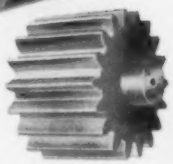
SPROCKETS



GIRTH GEARS



TRUNNIONS



PINION GEARS

*Specialists since 1916* in the fabrication of gears, tires, trunnions, sprockets and allied parts for processing equipment . . . Stroh engineers have perfected a method of applying a high grade, wear-resistant alloy steel to the wearing surfaces only of plain carbon steel. Let us show you case studies of long service life, economy and smooth operation of equipment.

*Write today!*

GEARS • PINIONS • METAL TIRES • TRUNNIONS • SHEAVES • SPROCKETS • CRUSHER PARTS • RACKS AND PINIONS

CRANE WHEELS • SPINDLES • COUPLING BOXES • CRAB COUPLINGS • MILL PINIONS

Stroh PROCESS STEEL CO.
Established 1916
PITTSBURGH 12, PENNA., U.S.A.
WALLACE YOUNG, South American Representative
Manufacturers of STROH ALLOY CAST TOOTH GEARS
CAST OR CUT TOOTH CARBON STEEL GEARS

**Joseph T. Ryerson & Son, Inc.**, Chicago, Ill., has announced the appointment of William O. Springer as manager of the New York plant to succeed James M. Mead, who has been transferred to the executive offices at Chicago for special administrative duties. Mr. Springer was formerly manager of the Cleveland plant and will be succeeded in this position by John W. Queen, formerly alloy steel division manager at Chicago.

**Macwhyte Co.**, Kenosha, Wis., announces election of the following new directors and officers: E. C. Berg, director, vice-president and controller; G. Johnston, director, treasurer and assistant secretary; M. A. Buntrock, director, secretary and assistant treasurer. Other officers and directors are: George C. Wilder, president; R. B. Whyte, vice-president in charge of operations; Robert P. Tyler, vice-president in charge of sales; H. E. Sawyer, Richard P. Cavanagh and James T. Wilson, directors.

**Rogers Iron Works Co.**, Joplin, Mo., announces the appointment of M. R. Lange as distributor sales manager of all domestic and foreign distributor sales. V. H. Nixon, chief engineer, continues in charge of all sales of equipment to the mining industry.

**Jackson & Church Co.**, Saginaw, Mich., has promoted L. F. Reimann to assistant vice-president of manufacturing. Associated with the company for 27 years, Mr. Reimann has been superintendent of the two plants in the Saginaw area since April, 1951. A. S. Sampierre is vice-president in charge of manufacturing.

**Raybestos-Manhattan, Inc.**, Passaic, N.J., announces the death on September 20 of Frederick L. Curtis, retired vice-president and former general manager of the Manhattan Rubber Division. He was 84 years old. Mr. Curtis, a pioneer in the rubber industry, started his career with the New York Belting & Packing Co. 70 years ago. He joined Manhattan in 1893 as office manager. He became secretary in 1903, a director in 1912 and a vice-president in 1913. In 1916 he became senior vice-president and assistant general manager. In 1929, at the merger forming Raybestos-Manhattan, Inc., he became treasurer and later vice-president. In 1940, upon the death of Col. Townsend, one of the founders of Manhattan Rubber Mfg. Co., he became general manager. Mr. Curtis retired in 1950. He was also one of the founders and first president of the New Jersey Engineering & Supply Co. at Passaic.

**Wheelco Instruments Division**, Barber-Colman Co., Rockford, Ill., announces that Richard K. Hungerford has been transferred from New York to Baltimore, Md., as district manager; Gordon Hubbert, formerly in the Chicago office, has been named district manager in Detroit; Howard P. Berger has been transferred from Baltimore to Cleveland; and Harold F. Dahlke has been transferred from Chicago to New York. Announcement has also been made of the establishment of three new district offices, namely, Grand Rapids, Mich., with Robert P. Campbell as district manager; Cincinnati, Ohio, with Edmund C. MacFaul as district manager; and Clarksburg, W. Va., with Earl J. Kelly as district manager. A sub-office in Charleston, W. Va., is in charge of J. McKeown.

**The B. F. Goodrich Co.**, Akron, Ohio, has appointed Richard T. Bules as manager of V-belt sales, industrial products sales department. He succeeds George J. Fischer, who has resigned.

**Hardinge Co., Inc.**, York, Penn., announces that Harlowe Hardinge, president, has been re-elected a director of the Pennsylvania State Chamber of Commerce for the third consecutive two-year term.

**Clark Equipment Co.**, Industrial Truck Div., Battle Creek, Mich., has appointed the Lukas Equipment Co., Columbia, S.C., as distributor in the state of South Carolina.

**Worthington Corp.**, Harrison, N.J., announces that the Service Engineering Co., Inc., Tulsa, Okla., has been appointed a distributor for Multi-V drives and Allspeed selectors in eastern Oklahoma, eastern Kansas, southwestern Missouri and northwestern Arkansas.

**Cook Bros. Equipment Co.**, Los Angeles, Calif., has formed a new division to handle Series MC trucks, which will be known as the Crane and Shovel Equipment Division. Robert H. Fox has been appointed sales director of the division. He was formerly associated with Six Wheels Inc., of Los Angeles.

**Schield Bantam Co.**, Waverly, Iowa, has announced the appointment of Kessler-Simon Machinery Co., Oklahoma City, Okla., as distributor in western Oklahoma.

**H. K. Porter Co., Inc.**, Pittsburgh, Penn., announces that William M. Taylor has been named manager of the export department, Quaker Rubber Corp., in addition to his duties as merchandising manager at Quaker. He was formerly assistant to the president of Wright Power Saw & Tool Co.

**Davey Compressor Co.**, Kent, Ohio, has announced the appointment of N. C. Hays as west central district manager for New Mexico, Arizona, Utah, Colorado, Wyoming, Idaho, Montana, the Las Vegas, Nev. trading area and the provinces of Saskatchewan and Alberta, Canada.

**Allis-Chalmers Mfg. Co.**, Milwaukee, Wis., announces that J. D. Greensward has been named vice-president and director of manufacturing of the general machinery division. He was recently named director of manufacturing to succeed Fred Mackey who resigned as vice-president in charge of manufacturing. Previously he was general manager of the Nor-



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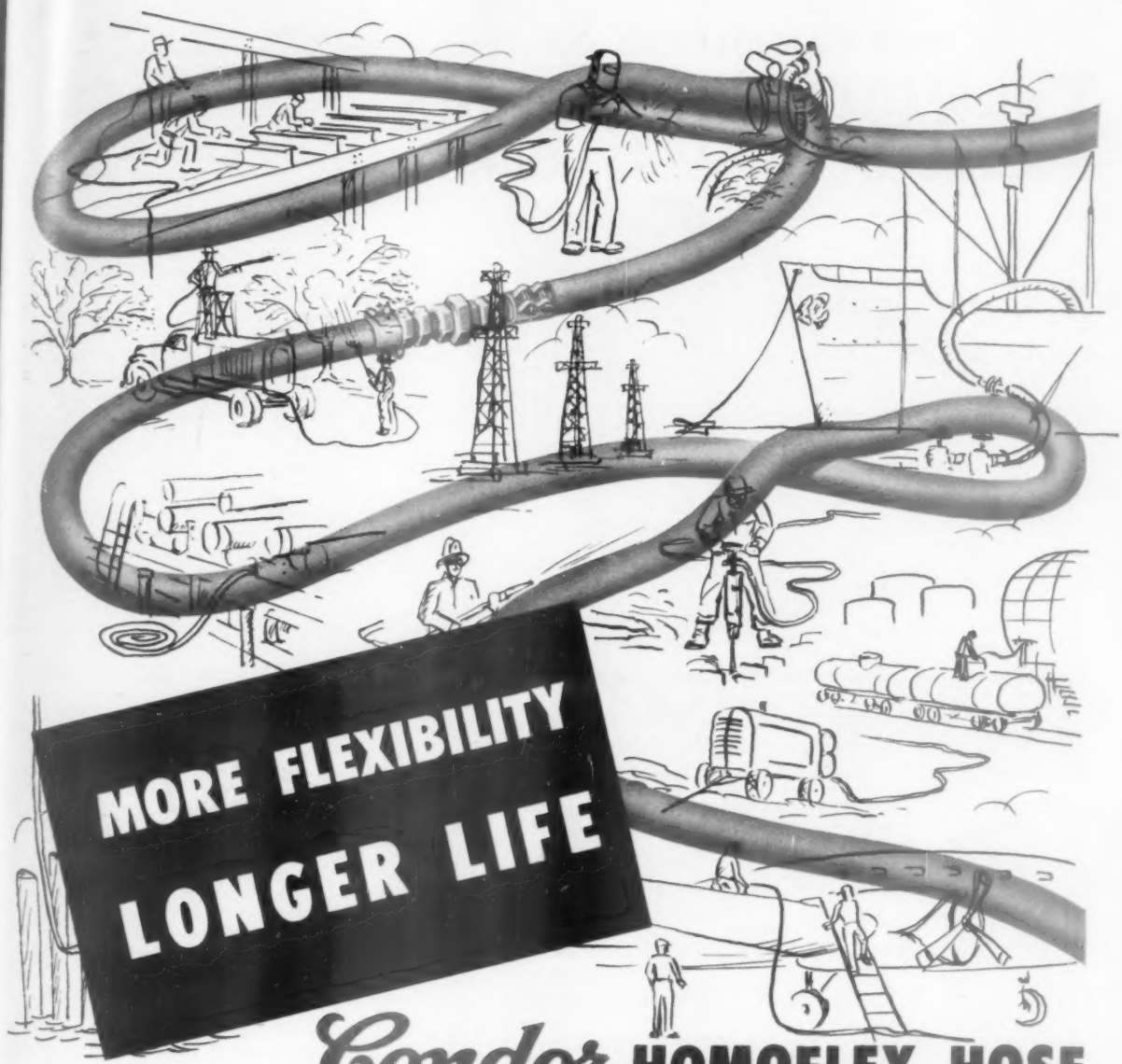



# *Condor* HOMOFLEX HOSE

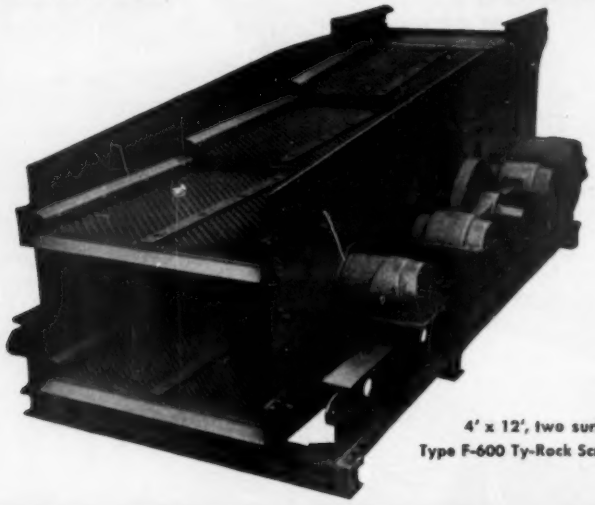
R/M engineers found a way to practically "homogenize" the wall of Homoflex Hose . . . By ingenious design, rubber tube and cover are blended together inseparably. The result, a hose wall with no pre-set twist, or stiffness. That's why Homoflex Hose is flexible as a rope, light and easy to coil and uncoil. Naturally, it lasts longer too. Made for air, water and other standard uses, Homoflex Hose has additional advantages described in Bulletin 6879D. Write for a copy • As the background suggests, Raybestos-Manhattan makes hose for every use. Your R/M Distributor will show you samples and discuss construction advantages.

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

## RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls

YOU CAN DEPEND ON
TY-ROCK SCREENS
BALANCED RUGGED



4' x 12', two surface
Type F-600 Ty-Rock Screen

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

EVANSTEEL

*Super Strength* Parts
are "tops" for resisting
SHOCK • WEAR • ABRASION • BREAKAGE

← EVANSTEEL Heat-Treated Hammers have proved far superior to any other material for pulverizing purposes.

EVANSTEEL Dipper Teeth give extra long service even in digging the toughest material. →

← EVANSTEEL Pug Mill Knives are highly wear resistant, yet not brittle.

EVANSTEEL Wire Rope Sockets have had no recorded service failure in 40 years. →

For high-strength parts . . . for an *extra* margin of safety . . . for weight-saving sections . . . use dependable EVANSTEEL. This chrome-nickel alloy has a tensile strength after annealing that averages up to 60% greater than ordinary carbon steel.

Write for EVANSTEEL Bulletin

CHICAGO STEEL FOUNDRY CO.
Kedzie Ave. & 37th St., Chicago 32, Ill.
Makers of Alloy Steel for Over 40 Years

wood, Ohio, works, and manager of the apparatus department and will be succeeded in this position by P. F. Bauer, formerly manager of the central sales region of the general machinery division, Cleveland, Ohio.

**The Dow Chemical Co.**, Midland, Mich., has appointed James Day, manager of fine chemical sales, to the executive staff of the New York office. Mr. Day joined the company in 1936 as research chemist and three years later transferred to the general sales office in Midland, Mich.

**Iowa Manufacturing Co.**, Cedar Rapids, Iowa, has released a new color and sound movie entitled "Aggregates Unlimited," which is designed for showing to civic groups as well as to contractors and engineers. Animated flowsheets show step-by-step progress of material through a crushing and screening plant. The film shows how Cedarapids equipment can produce large quantities of aggregate, and points up the importance of highway systems in regard to national economy. Information for showing of the film may be obtained from Kenneth Lindsay, executive vice-president and general sales manager of Iowa Mfg. Co.

**Clark Equipment Co.**, Battle Creek, Mich., has appointed the following distributors: Rushmore, Weber & Case, Inc., Albany, N.Y.; Dempster Bros., Inc., Knoxville, Tenn.; Equip-Co, Inc., Miami, Fla.; Industrial Truck & Caster Co., Inc., New Orleans, La.; Furnival Machinery Co., Philadelphia, Penn.; and Hull Equipment Co., Union, N.J.

**Zonolite Co.**, Chicago Ill., announces the appointment of Michael J. Feeney as sales representative for northern Indiana, with headquarters in Fort Wayne, Ind. He was formerly a salesman for the Celotex Corp.

**Miller-Komline Corp.**, Peapack, N.J., has established the Service Engineering Co., Summit, N.J., to handle the Miller-Komline process, with A. J. Phillips in charge.

**International Harvester Co.**, Chicago, Ill., has acquired the stock of The Frank G. Hough Co. of Libertyville, Ill., manufacturer of earthmoving, excavating and material handling equipment, which will become a wholly-owned subsidiary of International Harvester. Frank G. Hough will continue as president of the subsidiary company.

**Hewitt-Robins, Inc.**, Stamford, Conn., has moved to a new office and warehouse at 2604 S. Malt Ave., Los Angeles, Calif.

**The White Motor Co.**, Cleveland, Ohio, was recently granted a citation in the 1952 Mead Award national competition for its booklet "Creative Selling to Stone Quarries," prepared by Earl H. Lewis, sales training director, and Roy A. Fryer, sales promotion manager. This booklet is one of a series of "Creative Selling" manuals being published by the company.



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# CONCRETE PRODUCTS

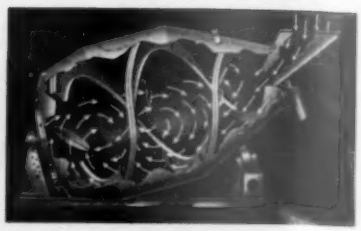
A SECTION OF ROCK PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE

New concrete pipe plant at Fairmont, North Carolina

# All these advantages *plus* top payload are yours in the Jaeger "Mix Plus"

**Up to 1200 lbs. lighter than 1951 models**



**The one and only "Dual Mix" drum**

Basic reason for Jaeger leadership. Fastest to charge, to mix, to discharge. Produces higher strength concrete and is designed for 8 to 10 years' service compared with 4 to 5 year life of cheaply-built mixers that weigh as much or more than Jaeger and cost as much or more to buy.

**The only open end loader with an instant-opening gate**

Eliminates problem of cement blow-back and water spillage when charging. Gives complete control of load.

**The only sealed end loader with a perfected grout-proof seal**

Ideal for agitators or reverse mixing on paving work. One wheel-turn opens it. One shot lubricates and flushes seal.

**The only 3-piece "To-the-Spot" chute and swing-away hopper**

Meets all conditions: places concrete where the customer wants it.

No need to remove chute head to discharge into extra big buckets or high forms. Chute head, plus 2 extensions, gives choice of 5'-8'-10' or 13' lengths. Chutes are wider, deeper, to handle the faster discharge of the Jaeger "Dual Mix" drum.

**The only truck mixer with "Comatic" hydraulic power transmission**

Gives finger-tip control of drum with either separate engine or truck engine drive.

Engine power does all the work. Automatic brake positively prevents shock load to transmission gears when reversing drum rotation. Specifically designed for truck mixer service; far simpler, safer and more dependable than the finest multiple clutch transmissions, and eliminates the problem of maintenance.

Chrysler engine, with fluid drive and automotive transmission with straight-line shift, also available if desired.

Jaeger-engineered chain drive (used for over 15 years on Jaeger side discharge truck mixers) employs replaceable tooth sprocket of 56" diameter and 2" pitch, 1½" roller chain; has at least 100% longer life.

***For full information and prices, see your Jaeger distributor or write us.***

## THE JAEGER MACHINE COMPANY

**603 Dublin Ave., Columbus 16, Ohio**

**World's largest builder of TRUCK MIXERS, AGITATORS • PUMPS • COMPRESSORS • CONCRETE MIXERS • PAVING MACHINERY**



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# INDUSTRY NEWS

## Smithwick Publication

SMITHWICK CONCRETE PRODUCTS, Portland, Ore., producer of Haydite concrete and masonry units and Haydite aggregate, issued its first publication of *The Smithwick Block Leader* in September, 1952. This monthly periodical is being published for the purpose of conveying authentic information about the company's products and where and how they are used. The periodical will contain news and photos of outstanding structures, and sidelights of interesting and unique uses of the various masonry units.

## Home Builders Show

NATIONAL ASSOCIATION OF HOME BUILDERS will hold its 1953 convention exposition at the Conrad Hilton Hotel, Chicago, Ill., January 18-22. Paul S. Van Auken, convention-exposition director, has announced that the number of exhibit spaces has been increased about 50 percent over last year's record show. More than 250 manufacturers of building materials and home equipment will display their products. Convention sessions will cover various current housing issues and the latest developments in construction methods. Joseph B. Haverstick, second vice-president of the association, is chairman of the convention committee.

## Seeks Renegotiation Exemption

THE NATIONAL READY MIXED CONCRETE ASSOCIATION has filed application with the Renegotiation Board, requesting exemption of ready-mixed concrete from renegotiation under the Renegotiation Act of 1951.

The Renegotiation Board recently published a list of exempt raw materials, including, among others, sand, gravel, crushed stone and cement. N.R.M.C.A. called attention to the Renegotiation Board that the industry, in producing ready-mixed concrete, uses raw materials which are exempted from renegotiation.

During World War II, sales of ready-mixed concrete were exempt from renegotiation under the "standard commercial articles" provision which authorized renegotiation officials to exempt such articles if competitive conditions assured protection of the government's interest. In 1944, the War Contracts Price Adjustment Board determined that competitive conditions affecting the selling of ready-mixed concrete protected the government against excessive prices. Due to the rapid growth of the industry in the past few years, competition in the industry has become even greater, a fact pointed out to the Renegotiation Board. Also, the industry feels that the burdens of renegotiation (segregation, filing of reports, hiring of additional employes to handle renegotiation, etc.) cannot be justified in light of the fact that virtually no benefits can accrue to the government from such renegotiation.

## Prestressed Concrete

THE SECOND ILLINOIS ENGINEERING CONFERENCE was held November 12-14, 1952, at the University of Illinois. One entire session was devoted to prestressed concrete. C. P. Siess, research associate professor, Department of Civil Engineering, University of Illinois, presided at the session. The speakers were M. N. Quade, partner of Parsons, Brinckerhoff, Hall and Macdonald, consulting engineers, New York, N.Y., who spoke on "What Can the Engineer Expect from Prestressed Concrete?"; and Cedric Stainer, assistant chief engineer, The Preload Co., New York, N.Y., who spoke on "Types of Prestressed Concrete Construction: Factors Affecting Their Selection and Uses." A panel discussion followed the speeches.

## Price Clarification

THE O.P.S. INTERPRETATION (to GCPR, SR-108), issued last summer, which authorized a 4-percent increase in the ceiling price of dry-batched materials, was expressed in such a manner as to create uncertainty as to whether the increase applied to all dry-batched materials or to dry-batched materials delivered to job sites only. Wishing to clarify this matter for association members, the National Ready Mixed Concrete Association, acting through the Ready Mixed Concrete Association of Metropolitan Pittsburgh, obtained the following O.P.S. official statement: "We regret any inconvenience which may have been caused by your misunderstanding of this interpretation. We had no intention to limit its coverage to dry-batched materials delivered to job sites only, but we did intend to include all dry-batched materials."

## Concrete Products Plant Opened

CLINTON CONCRETE PRODUCTS CO., Clinton, Ill., has started the production of ready-mixed concrete. Owner and manager is W. F. Jeschawitz. Later the company plans to handle a complete line of concrete products such as tile, block, posts, reinforcing rods, wire and other hard materials.

## Cover Picture

ONE OF THE newest additions to the concrete pipe industry of North Carolina is the Fairmont plant of Pipe, Inc. This plant and the company's Fayetteville, N.C., plant are described in an article beginning on page 178.

A & E READIMIX CONCRETE CO. celebrated its third anniversary by establishing a new batching plant at Arcata, Calif. Owners of the company are Joe O'Neil and Bill Anderson, both affiliated with Mad River Sand and Gravel Co.

EVER READY MIX CONCRETE CO., Davenport, Iowa, is building three material storage bins at its Bettendorf plant. Two elevated concrete material bins and one bin for bulk storage are included in the construction which will be done by Henry R. Schaefer Construction Co.

ROLLA CONCRETE MATERIALS, Rolla, Mo., has expanded its present operations by the addition of a ready-mixed concrete plant.

A READY-MIXED CONCRETE PLANT has been established at Mandan, N.D., by Raymond Delzer, Bismark, N.D. The plant, which will be operated under the name of Deco Ready-Mix, has a daily capacity of 500-600 cu. yd. of concrete.

BREIDENBAUGH BROTHERS BETTER SUPPLY, INC., Jasper, Ind., recently established a ready-mixed concrete plant at the Naval Ammunition Depot at Crane, Ind. The company, founded six years ago, is one of the largest concrete products producers in southern Indiana. Over 1,000,000 block i produced annually, in addition to its other building products.

MARSHALL CONCRETE PRODUCTS CO., Marshalltown, Iowa, producer of concrete block and other precast concrete products, plans to expand its present operations to include production of concrete joists, floor systems and tile.

OHIO CONCRETE CO. recently began operations at its new ready-mixed concrete plant at Waverly, Ohio. Capacity is approximately 80 cu. yd. per hour. The company also operates concrete plants at New Boston and Ironton, Ohio.

ADRIAN CONCRETE PRODUCTS CO., Adrian, Minn., was recently purchased by Richard Arp and William Veenhof, Luverne, Minn., from John Kriep of Adrian. The two men will be partners of the business which specializes in the production of drain tile, well tile, septic tanks, and related concrete products.

GARRISON READY-MIX CONCRETE CO., West Memphis, Ark., has been granted a $50,000 loan from the Reconstruction Finance Corp. for expansion purposes and to pay off a prior lien on machinery and equipment. The loan is to be repaid in five years, at 5 percent interest.

PARKS CONCRETE CO., Bartlesville, Okla., was recently sold to H. R. Carlson, Sr., and H. R. Carlson, Jr., who will operate the plant under the name of Carlson Concrete Co. A new 5-cu. yd. Smith mixer on a GMC truck has been added to the company's truck fleet, making a total of five trucks with a combined capacity of 15 cu. yd.

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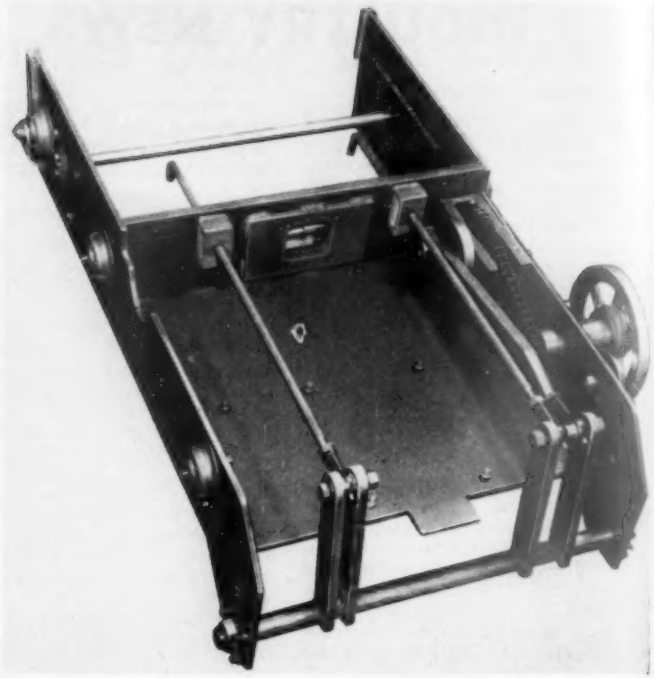

THE ability to turn out consistently superior block is no accident. Every successful block man knows that it takes the right combination of an experienced operator *and* an outstanding machine . . . a machine like the Lith-I-Block. Truly, here is the machine that is designed in every detail with just one aim. It is built to give you top volume at a really low unit cost and, most important of all, Lith-I-Block gives you unexcelled quality day after day. No matter what aggregate you use, no matter what type of block you are making, you always get uniform density, evenly textured surfaces and edges as true as a die.

To achieve this quality at the head-long pace of normal production takes almost superhuman control over each step in the block cycle. And one of the key elements that makes this control possible in the Lith-I-Block is a special kind of feed drawer . . . a feed drawer that is ruggedly built to give superb performance. Here, while the aggregate is carried forward to the mold box, two shaker bars oscillate 275 times a minute. They break the aggregate down into an even, smoothly flowing stream so there are no lumps or hollow spots to interrupt the compacting action in the mold. Results . . . the uniform aggregate distribution that contributes so much to Lith-I-Blocks famous quality.

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1 If you want to keep your phone ringing with orders, look into the many, many advantages that Lith-I-Block alone offers. Write for the free booklet "THE MACHINE THAT BUILDS SUCCESS".

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SALES AND SERVICE from COAST to COAST

## THE LITH-I-BAR COMPANY

DEPT. CP-12, HOLLAND, MICH.

# DEVELOPING A BIG BUSINESS IN A SMALL TOWN

**Attention to the little details of production, promotion and community relations contributes to the excellent sales trend of Salina, Kan., concrete products company**

By TIP BROWN

BUSINESS PLANNING of the long range type has demonstrated its effectiveness in the experience of Salina Concrete Products, Inc., Salina, Kan. The present management acquired the property ten years ago and first started on a plan of bringing the manufacturing and delivery services to a standard of the highest order. The planning body, composed of president J. J. Spaeth, vice-president and general manager Carl C. Engstrom, and secretary and plant manager Jack Weisgerber, appears to have reached its ultimate ambitions in this respect.

Mr. Spaeth brought seasoned wisdom from his management of a successful farm machinery business, the Wyatt Manufacturing Co. Mr. Engstrom, an enthusiastic and forward-looking concrete man with a background of broad experience in the concrete stave silo field, joined the organization in 1942. Mr. Weisgerber has had a production job that covered a diversified field of concrete block, stave silo block, ready-mixed concrete and the upkeep of 20 delivery trucks of which ten are transit mixers. Plant equipment consists of a Besser Super Vibrapac with a daily rating of 6500 8-in. units, a ready-mixed concrete plant with 1200-bbl. bulk cement bins and five stave silos for storing 600 cu. yd. of aggregate and two Monarch stave silo machines of 1800 daily capacity. Storage inventories are usually around 300,000 block and 50,000 to 75,000 staves. The company has never been modest in demanding adequate manufactured product to meet any sales requirements.

For a long time Mr. Weisgerber's greeting on arriving at the plant in the morning has been a string of cars on the Missouri Pacific railroad siding which usually included covered hoppered-bottom cement cars, together with other cars of crushed stone and Haydite. Then there were empty cars placed for loading out block and staves to outside points. The siding holds ten cars. Sand is brought in by truck. The company pay roll has a peak of around 45 people including the office personnel.

The plant is ten blocks from the business center of Salina, a town of 30,000 people, almost in the middle of the state of Kansas and a trading and educational center for a rich agricultural area that includes practically the entire northwest quarter of the state. The silo stave distribution is state wide and requires concentrated attention as erection of the silos is usually included in the sale. Ready-mixed concrete has grown into general use on city wide monolithic work. Both light- and heavy-weight concrete block have a wide distribution through established dealers in the trade area.

### Marketing Important

Assuming that a good planning body eventually solves most of the manufacturing problems of such a diversified business, the matter of providing operating cash through sales is a major performance, which

The company's recently completed modernistic office helps sell its products

unfortunately in many concerns is left to chance that there will be more ups than downs in the business cycle and there is no need to cross bridges until you come to them—not so with the planning schedules at Salina Concrete Products, Inc. Marketing is a major operation day in and day out. General manager Engstrom has the assistance of a personable and alert sales manager in Lyle Morgan and between the two of them, there is considerable attention paid to good sales promotion.

Selling power that is backed by knowledge, and the desire to sell is the secret to moving the diversified output of this plant. A cardinal principle from the highest to the lowest in the sales organization is meeting the public on the right basis. This is exemplified daily through good schooling in the office in answering the telephone and greeting visitors to the plant.

A silent sales messenger is the clean cut appearance of the fleet of company trucks. They are kept in good mechanical condition at the company shop, painted at least every other season, and washed as often as possible, usually once a week. A light gray paint carries out the cement color of the products on truck bodies and black lettering brings out the firm name in strong relief and captures public attention. The trucks do a wholesome publicity job with no more cost than good housekeeping practices.

Another infallible rule is for the salesman to specialize on the product he is selling. Experience has taught that he will do that in any event. Consequently a sales engineer, Flavel Simcox, is established in his own office with drafting board and can quickly sketch on paper ideas from the salesmen and prospective builders. Three salesmen cover the state in the sale of stave silos; one man looks after outside concrete block sales, and sales manager Morgan has the Salina market for his particular territory. Expansion of merchandise lines to include aluminum windows, paints and other items closely associated with their distribution is creating many new sales outlets which will later be intensified with personal sales effort.

An intercommunication system between office and the plant has proved a great time saver and responsible for many a sale where a quick decision based on information secured in a few minutes over the system is possible. Plenty of telephones is another public relations factor in improved selling. "Nothing infuriates a customer so much," claims Mr. Engstrom, "as eternally getting a busy signal on his calls to us. We have three incoming lines and nine telephone stations in our office and we will get more when needed. Telephones are much easier to get than new customers."

A concrete masonry barn near Salina

## Selling by Example

Mr. Engstrom continued by saying that for ten years they had foreseen the time when it would be necessary to leave their old and outmoded office building for a building that would express both outwardly and inwardly the sales story of their product. "We had to wait," he said, "until the time was right for the new building but it was always on the agenda." It was finished last March and 1200 townspeople came out to view with astonishment what can be done with concrete masonry to bring new beauty, comforts, safety and permanence to a commercial building.

Shaver & Shaver, Salina architects, let down their architectural hair, so to speak, in an ultra-modern one-story design with a frontal attack of a 35-ft. pylon and an office entry of masonry wall pattern combined with expansive use of glass and flat roof that is distinctive and original. The visitor steps inside to approach the counter of the work room or to browse about the display room that is a new high in day lighting and good sales showmanship. A well constructed display rack holds catalogs and building information to meet almost every need. The walls are utilized for built in displays of paints, facsimile of stave silo construction, and samples of various types of concrete block. The entire office building is a display case for aluminum windows, modern artificial lighting, and intriguing patterns of concrete masonry, painted both inside and outside the building, in light pastel shades giving an effect of freshness and cheerfulness. The exposed concrete ceiling joists throughout the entire office are the supporting members for a concrete block ceiling system which also works equally well in floors. The joists are set on 18-in. centers using 4- x 8- x 16-in. Haydite block and are topped off by 1½ in. of Haydite concrete for added strength and insulation. Conventional type of built up flat roof was applied. The joists are 3 x 8 in. with 20 ft. maximum lengths and two bar steel reinforcement with joist stirrups. The floor system uses the same basic members but is finished off with a 1½-in. concrete topping. Joists are cast to provide a ½-in. ledge to support the block fillers.

A sales conference room in the front of the building is an outstanding asset as it provides an atmosphere that is conducive to progressive thinking and concentration upon the needs of purchasers without interruptions of any kind.

The work room is well planned for employe comforts and efficiency, even to painting a large expanse of glass block to keep down glare. Stor-



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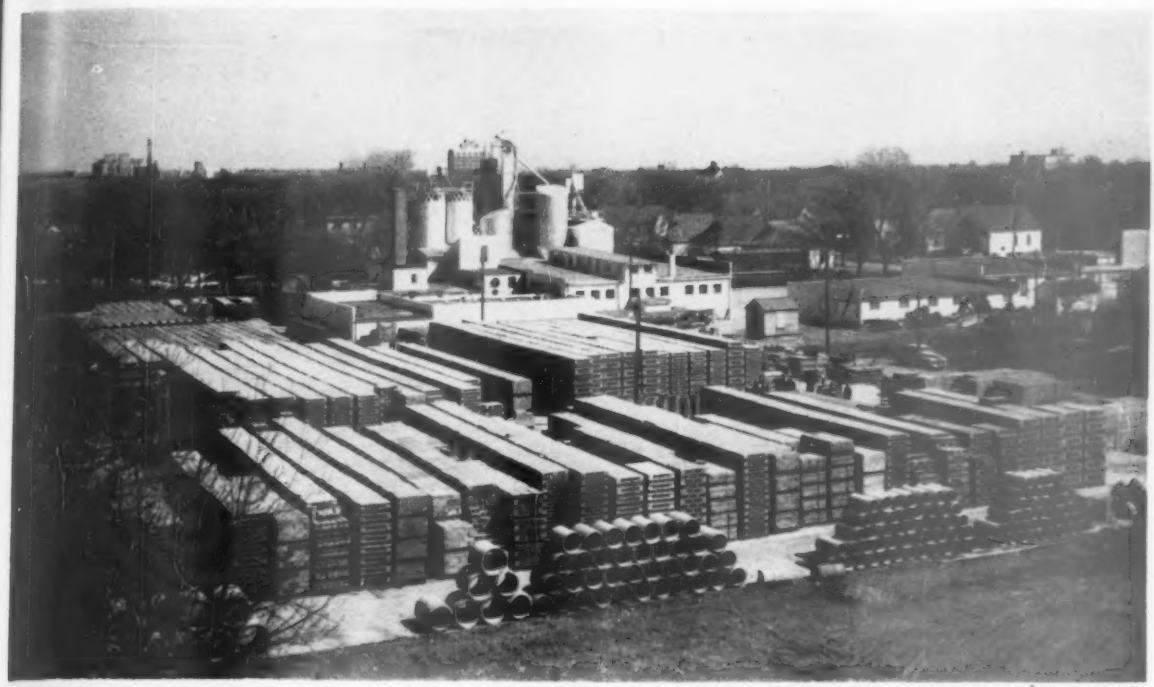


**Salina Concrete Products' plant incorporates concrete block, silo stave and ready-mixed concrete production; storage capacity is sufficient for 300,000 block**

age space for office records, stationary, and many other needs has been provided in abundance and in a manner to keep them out of sight and free from exposure to blighting effects.

The satisfactory results obtained from working harmoniously with the architects and the building contractor, Busboom & Rauh, Salina, have been apparent many times in referrals by them of prospective customers and in creating a favorable atmosphere for the use of concrete products. Both architectural and contractor endorsement is a most valuable sales asset.

## Advertising's Role

"Our long range planning reached a climax," Mr. Engstrom reported, "when we reached the point where we could literally go on the air and indulge in newspaper advertising displays to our heart's content." Local radio station KSAL has brought in many substantial orders and Salina Concrete Products is sold on radio advertising. Daily participation in a 15-min. newscast follows a popular commentator at 6:15 p.m. The full line of products is introduced by the announcer and special concentration upon a single product follows at intervals during the broadcast. A morning broacast to reach the farm market is tuned in daily at 6:45 a.m. with a western type program.

Great importance is attached to the sponsorship of sports events on the air. During the football season, the local station has a play-by-play account of the local high school and college games as well as an on-the-scene broadcast of the state university games at Lawrence, Kan. The company purchases this and a similar sponsorship for the local basketball games. The cost is usually from $150 to $185 for each broadcast but the appreciation of the home folk audiences is so great and continues in such an increasing tempo that the company considers this a top investment in good public relations.

Newspaper advertising has been used consistently for many years in the Friday evening issue of the *Salina Journal*, a paper that is widely read throughout the trade area. A display space of two columns by 8 in. or three columns by 5 or 6 in. is used to focus interest in some individual item of manufacture. Mr. Engstrom is opposed to mixing items because of loss of power in the sales message.

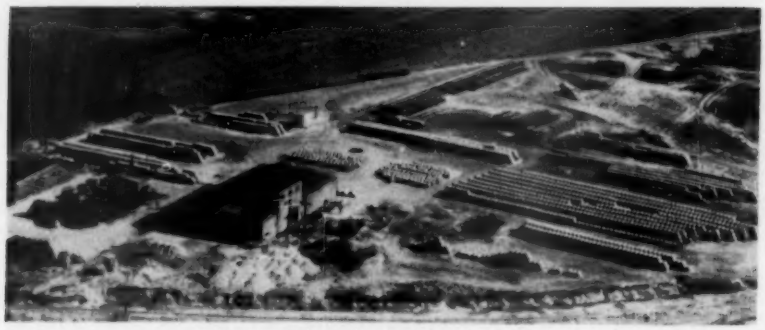
Frequently there are happenings in both the selling and production ends of the business that are of distinct news value and welcomed by local publications if they are free of any tinge of advertising. Such opportunities should never be overlooked as they are often more valuable than paid advertising space. A newspaper reporter is glad to have information relating to new personnel, public relations programs, and extensions of plant or equipment. Wide public acceptance of a product is usually the result of alertness in spreading the story.

Photographs of jobs underway and completed are bound in book form for the use of salesmen and are indispensible for holding the interest of prospective customers.

Public demonstrations of new masonry houses rates high with the sales management of the company. A year ago, Mr. Engstrom completed a mod-

(Continued on page 191)

**The home of Carl Engstrom, vice-president of Salina Concrete Products, demonstrates to prospective customers the advantages of concrete masonry construction**



Aerial view of Pipe, Inc.'s Fayetteville, N.C., plant

**Pipe, Inc., affiliate of North Carolina Products Corp., has placed two modern concrete pipe plants in production in Fairmont and Fayetteville**

# Carolina Pipe Industry Expands

By WALTER B. LENHART

THE CONCRETE PIPE INDUSTRY in the Carolinas during the past two years has received added impetus to its steady growth from several sources. In South Carolina it was the multi-billion dollar H-bomb program now underway in the eastern part of the state. To serve this development a large plant went into production at Orangeburg, S.C. The second major development was the erection of a million dollar concrete pipe plant at Columbus, S.C., for production of high pressure concrete pipe for municipal water supply systems and other purposes. Another factor has been the steady population and industrial growth in North and South Carolina. More and better drainage of agricultural land, small construction programs and highway construction all add to the growing concrete market.

One of the leading manufacturers of concrete pipe in North Carolina is North Carolina Products Corp. with plants at Raleigh and Kingston, N.C. Its affiliate, Pipe, Inc., with plants at Fairmont and Fayetteville, N.C., now both in their second year, is also an important producer in the area. The two plants of Pipe, Inc., are the newest additions to the pipe industry of North Carolina and their construction and operation may indicate a trend toward a multiplicity of smaller plants at widely dispersed points as one answer to increasingly high freight rates.

The Raleigh plant of North Carolina Products was described in the April, 1948, issue of CONCRETE PRODUCTS, page 184. The Raleigh plant makes pipe of larger dimensions although the Kingston plant with its Universal tamper can make pipe of a comparable size. The Raleigh operation has a Martin packerhead and a Universal tamper, as well as a Besser Super Vibrapac block machine which was installed in 1951.

The Fayetteville plant of Pipe, Inc., is southeast of town and adjacent to the aggregate plant of Becker County Sand and Gravel Co., the source of aggregates used at the pipe plant. The plant uses a Universal tamper. Lehigh and Penn-Dixie sacked cements are used and handled on pallets. Pipe from 12 in. through 30 in. are made here. Two steam kilns are available for curing and experimental work has been going on in regard to the curing cycle. An innovation is the use of a Behlen dehydrator as a source of heat for curing. The Behlen dehydrator is a midwestern development for drying corn and other agricultural products. It is a small, compact oil- or gas-fired furnace unit and the work at Fayetteville revolves about the use of the heater, in conjunction with water sprays and a small boiler, to supply steam to the kilns. After curing, the steam can be shut off and dry heat applied. Curing temperatures are in the 115 to 120 deg. F. range. A Towmotor LT-60 is used in the yard with a Clark fork truck for use in the kilns. Aggregates are delivered to the mixer, which is slightly below floor level, by a small front-end loader. The plant is served by the Atlantic Coast Line railroad.

The Fairmont plant of Pipe, Inc., using a McCracken packerhead made by Concrete Pipe and Manufacturing Co. Pipe, Inc., also makes highway

The Fairmont plant also manufactures highway markers and septic tanks. Left: Finished tank is used for advertising purposes. Right: Tank forms



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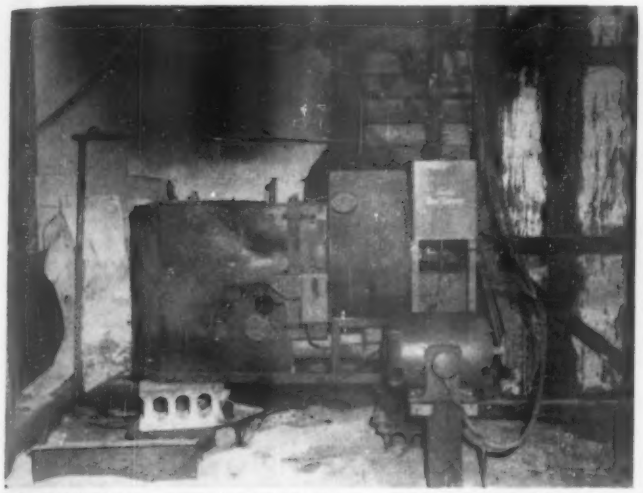


**Left: A dehydrator, commonly used for drying corn, is the source of heat for curing at the Fayetteville plant. Right: At the Fairmont plant, the mixer is set below floor level and a drag chain delivers concrete to the packerhead pipe machine. Aggregates are weigh batched in overhead bins**

markers and septic tanks. The forms for the latter are a product of Carpenter Manufacturing Co. This steel form is quite popular in the southeastern states. Aggregates are weigh batched from overhead bins. The mixer is set below floor level and a drag chain delivers the concrete to the packerhead. The plant has three kilns with steam supplied from a low pressure, coal fired boiler. Clark lift trucks handle the plant's output.

The Fairmont operation procures sand from a company-owned pit about six miles east of the pipe plant. Cars are unloaded at the plant by a Quick-Way crane mounted on an Autocar chassis. Bulk cement is used. A Ford truck is available for handling sand and the dump body on it can be removed and replaced with the septic tank haulage equipment.

The head office of North Carolina Products is in Raleigh, N.C. Henry Shaw is general manager and secretary-treasurer of the company and is also general manager and president of Pipe, Inc. In both companies, Mr. Shaw is assisted by James McKee as assistant general manager. Thomas E. Moore is plant foreman at Fayetteville, and at Fairmont, Donald MacCallum is plant foreman, with Clem Provins as superintendent of the two plants of Pipe, Inc. Jesse Weeks is superintendent of the Raleigh plant and Chris Giles is superintendent of the Kingston plant, these plants being operated under the name of North Carolina Products Corp.

## High-Density Concrete

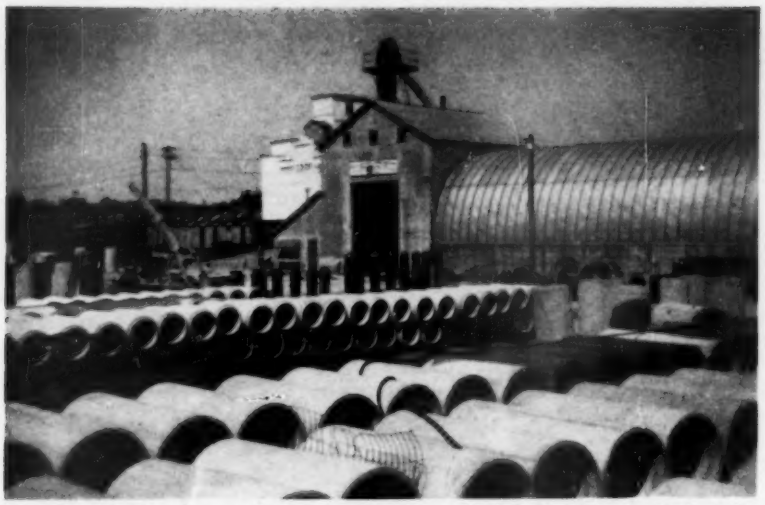
LEE DON, Inc., Harmarville, Penn., is a newly formed company, organized for the purpose of producing and marketing a new densifier which makes possible high heat-conductive concrete for use in radiant heating and structural applications. Levi C. McCrady is president of the new firm, and Donald H. Butler, owner of Products Planning Co., Pittsburgh, Penn., which developed the product, is vice-president. Patents have been applied for the new product which has been given the commercial name of "Heatcrete."

Heatcrete is also said to have promising possibilities for use in all-year-round temperature conditioning. For this purpose, in the summer, cool water is run through the radiant heating pipe located in densified roof slabs whose temperature-diffusing quality is said to enable maintenance of low room temperatures. A single system for both heating and cooling could offer substantial savings to building owners. For further economy, it is also claimed that the greater heat transference of concrete made with this product requires less pipe to do a heating job than does standard concrete.

Other potential applications of the product include its use in radiant heated pavements, sidewalks and driveways; and in the cooling of industrial floors used for high temperature work.

The densifier is packaged in 35 and 70 lb. bags. Initial sales were made through Perlite Manufacturing Co., Carnegie, Penn., which is acting as distributor in western Pennsylvania. Distributorships are being established throughout the country.

**Fairmont plant. Left: Interchangeable bodies make this truck a dual purpose unit. Here it is equipped with the septic tank hauling equipment; by changing to a dump body, the unit can be used to haul sand from the company's pit. Right: Truck-mounted crane handles aggregates at plant**



Concrete drain tile, culverts and cattle passes in the yard of Elk River Concrete Products Co.

# PRODUCTS OUTPUT BOOMS IN NORTH CENTRAL STATES

By ROBERT FOSS

MANY EXAMPLES of a concrete industry boom in the north central rural area of the United States can be cited, but a good example of all of them is found in the small city of Fergus Falls in west central Minnesota. This city of 12,000 lies at the western edge of northeastern Minnesota's wooded hills and at the eastern edge of the flat agricultural land of the Dakotas. The boom in its concrete industry during the past five years has helped considerably to enlarge its reputation as an industrial center in this area. In this period, the concrete industry has boomed into one of the biggest, richest and heaviest of industries of this traditionally trading and agricultural community.

In short, it has helped considerably to industrialize an average rural community of north central America. And it has played a major part in trebling the volume of construction in this area. The rapid growth in this community is typical of what is taking place over much of the nation.

At present there are four separate concrete products firms in Fergus Falls. They are the Fergus Concrete Products Co., Riverside Concrete Products Co., Fergus Ready-Mix Concrete Co., and Elk River Concrete Products Co. Even with the seasonal basis on which they have to operate, these four companies turn out each year over 30,000 tons of concrete products. Their actual capacity is about twice this tonnage of products if the season were longer and cement always plentiful. The demand is there.

Fergus Ready-Mix Concrete Co.'s plant

These four companies which make up this local industry employ several dozen persons and their total payroll passes the $50,000 a year mark. Their industrial output in actual dollars and cents surpasses $250,000. Their products are diversified, from block, lintels, sills and drain tile to culverts and specialties. Their market area extends into neighboring counties and into North and South Dakota.

Both Fergus Concrete Products Co., and Riverside Co. produce concrete block. Fergus Concrete Products Co. was started by H. C. Lampy five years ago upon his return from service in the armed forces during World War II. Mr. Lampy felt there was a great need for concrete products by the building industry in this area, so he set up his plant covering almost an acre of land.

Riverside Co. was installed in an old pumping station by Vernon Lee and Ed Lenthe five years ago. Block production is more than 150,000 a year.

Youngest of the companies in the city's concrete industry is Fergus Ready-Mix Co., operated by Oliver Jacobson and Milton Hanson on land adjacent to the Fergus Concrete Products Co. Plant manager of the firm is Einar Hegge. This company started its operations four years ago, and in 1949 and 1950 enlarged and enclosed its plant and installed heating equipment for winter operation. Production is at the rate of 120 cu. yd. per day, which is delivered throughout a 50-mile radius of Fergus Falls.

Oldest and largest of the products companies of this locality is the local plant of Elk River Concrete Products Co. This firm was started in 1909 as a locally-owned concern under the name of the Dennison Tile Works. Elk River Concrete Products Co. purchased the plant in 1936.

This plant, whose local manager is Mike Schreifels, produces reinforced concrete pipe or culverts, ranging from 12 to 84 in. diameters. Other products the firm makes are concrete railroad crossing planks, which substitute for wood and steel in bridge construction, and spreading culvert ends for inlets and outlets of culverts. The company's products are distributed throughout the area.

## Colored Concrete Block

SELBY CONCRETE BLOCK CO., Atoka, Okla., has started production of colored concrete block. The plant has a capacity of 500 to 800 block per day. The block are made in red, green, pink and blue shades.



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**3. A producer views the ready-mixed concrete business . . . .**

# MORE POINTERS IN PLANT PLANNING

By JAMES A. NICHOLSON

GOOD SOLID THINKING must be employed in deciding operation sequences, studying procedures to simplify operations, planning production efficiency, anticipating space requirements or selecting processing and delivery equipment. In planning new plants, additions or alterations, such thinking is of greatest effectiveness when written aids, including outlines, assembly charts, blueprints and maps, are used.

In all plants, aggregates must be elevated, weighed and discharged into trucks. In central-mixing plants an additional operation, mixing, is required. At a few plants, material is not elevated until after batching or mixing has been completed. In batching plants the preferred sequence is elevating, weighing and discharging (into transit mixers). At central-mixing operations the preferred order is elevating, weighing, mixing and discharging.

At all plants, the hauling units should be completely loaded in one swift gravity charge. In a batching plant, with the completion of a single weighing-out cycle, the largest transit mixer in use should be fully loaded. At a central-mixing operation elevating equipment should be adequate and the weighing facilities so planned that the central mixer can be completely filled (including allowable overload) in one swift charge. The hourly capacity of a central-mixing plant should be limited only by the size of the mixer and the time of the mixing cycle.

Plant operations should always be synchronized with the delivery equipment. If plans call for the use of single-axle trucks, a load of 3½ cu. yd. should be handled in one operating cycle. If the intent is to use tandem delivery equipment, the plant facilities should handle 5 cu. yd. in one operation. If the plant is located in an area where overloading definitely will be allowed, facilities should handle the maximum allowable load in one operating cycle.

The use of charts and drawings helps to point out mistakes, answer questions and solve problems. When you are already operating one plant, you learn, or should learn, how you can build a better installation. Visits to successful operations can be of similar assistance. At several of our own plants, pits were constructed at the base of the cement elevators. After rains, water was trapped, hardened cement regularly found its way to overhead storage, equipment was damaged and down time followed. In recent installations, such difficulties were eliminated by placing the base of the elevators well above ground grade.

A major question at the time of planning a new plant is "What can be done to reduce over-all plant height"? Too much attention cannot be given to this important question. By coming up with the right answers, substantial savings are made in initial cost, erection and daily efficiency. At many plants, compartments in the aggregate bins discharge through a single gate into the weigh hopper. By cutting off the bottom three or four feet of the bin, a twin gate arrangement can be effected with substantial reduction in plant height. There are other merits in this simple step:

1. Very little bin capacity is sacrificed.
2. Aggregates weigh out faster.
3. Bridging of sand is avoided; there is less possibility of segregation.
4. Bin heating coils offer less obstruction to the flow of sand.
5. Steam jets get steam faster to more sand.
6. A smaller, higher placed weigh hopper can be effectively used.

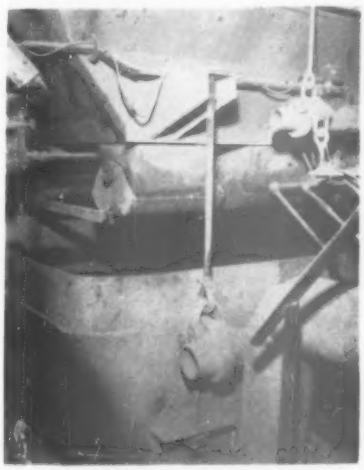
Some operators, strategically located, have been able to avoid the handling costs and operating problems associated with the ground storage of aggregates. When it can be safely done, the elimination of ground storage is our industry's number one example of simplifying operations.

Limiting inventory of aggregates to overhead storage should only be considered when (1) the concrete plant is a relatively short distance from the aggregate supply, (2) there is a certainty of uninterrupted truck delivery, (3) aggregates are uniformly well graded and immediately usable as received (e.g., no seasonal interference), (4) there is ample overhead storage for several hours operation, and (5) elevating equipment charges bins faster than the plant can load trucks.

Through careful planning you can build a safe, efficient, trouble-free plant, one that is easy to erect, operate and service. Some operators, on the other hand, by failing to make proper plans, are erecting new plants that are outmoded before construction is completed.

The projected plant layout should be of compact design. Provisions should be made for full use of all available space, protection for employes and top operating efficiency. Controls, covering factors of cost, quality and production, should be centered where operating personnel can use them with utmost efficiency and least amount of wear and tear. Equipment throughout the plant should be so arranged that it can be most easily operated and serviced.

The use of automatic dispensing equipment gives simple, effective control over air-entraining agents, calcium chloride and other admixtures. A timing device on the stationary mixer adds greatly to its efficiency and increases the number of mixing cycles that can be safely handled. Slump and moisture determinations are similarly effective in lowering costs, increasing production and improving quality.



**Truncating the aggregates bin above the weigh hopper and installing gates on each side achieves the dual purpose of reducing plant headroom and speeding flow of material into the hopper**

Have everything handy! Plan conveniences for employes that will lead to additional operating profits. At a batching plant provide for a one-stop operation. Don't force the transit-mixer driver to make three stops—one each for water, aggregates and cement. At a central-mixing plant, see to it that weighing and mixing controls are brought to the operator.

Typical central-mixing plant operator's control station, affording the mixer operator a clear view of the concrete as it is being discharged to the truck below

Place them for his convenience. Don't force a mixer operator to move from electrical controls, to the scales, then on to the water meter and the mixer. Plan a plant that is both efficient and labor saving. It can be done. Do not settle for less. Arrangements at weighing facilities should be such that the weigh man, in one position and at the same time, can batch aggregates, weigh cement and meter out (or otherwise measure) water.

The plant layout should be so planned as to eliminate all possible hazards to life, limb and property of employes and visitors (including unwelcomed children). If you plan to use a crane in elevating aggregates, the layout should be arranged to protect plant men and other employes against either a dropping of the bucket or a collapse of the boom.

In laying out an operation, recognize the importance of good plant housekeeping. Build a plant so that it can be kept clean. Then keep it clean! Our East Side plant is practically an obstacle course. Cleaning, maintaining and repairing are difficult assignments. Our newer West Toledo plant looks, and is, shipshape. Things are where they should be. The operator is in proper position with production buttons at his finger tips. The plant is most compact, yet there is adequate aisle space for easy servicing. Plenty of natural light is provided through the abundant use of transparent plastic which is also added protection against pilferage and damage to equipment. It is a modern, efficient plant, permitted to operate in a neighborhood that is largely residential.

Whenever possible in your planning, provide for operation continuity even though some of the production equipment should be temporarily out of order. If material gates are electrically or air operated, have manual levers ready to take over. If there are two compartments in the cement bin, the use of two screw conveyors in feeding the weigh hopper would represent good planning. In case one conveyor should be forced down for repairs, the plant could still be operated at full capacity.

The expansion qualities of property under consideration as a new plant site are of prime importance. Equally important is whether or not the contemplated plant will handle, over the years, an anticipated increase in business. Our annual business of ten years ago compares now to a month's production. If financial conditions permit a freedom of choice, it is better to start with too much rather than too little. Later on you may want to convert to central mixing or use larger transit mixers. Provide adequate space both vertically and horizontally for efficient operation, ease of maintenance and good housekeeping. The plant you are planning may answer today's needs. Can it be expanded to handle double the production in five years?

## Aggregates Handling

At all ready-mixed concrete operations, aggregates must be delivered, unloaded, stored and handled. Under present practices of the cement industry, delivery of its product is generally provided by the manufacturer. When cement is delivered it must be unloaded, elevated and stored. Provision must be made for elevating both aggregates and cement to necessary overhead storage bins, measuring out the ingredients that go into the concrete, mixing the concrete (central-mixing operation) and discharging into the hauling units. In the winter season, heating facilities must be available so that concrete of specified temperature can be processed and delivered. At the time of purchasing plant equipment a decision must also be made to purchase or lease so many hauling units of a given type and capacity.

Aggregates are delivered by rail, truck and barge. Delivery by barge requires that both the shipper and the producer have waterfront facilities. Unloading is done by crane or conveyor from positions either on the barge or on the dock. Ground storage of aggregates is a must for plants depending on rail or water delivery and is generally desirable at plants that are serviced by trucks.

Railroad shipments are made in gondola or hoppered-bottom cars. Cranes are used to unload gondola cars, transferring the aggregates to ground storage piles, to receiving hoppers of elevators and conveyors or directly to compartments of overhead bins. When shipments are made in hoppered-bottom cars, unloading may be made from a trestle position direct to a stockpile or onto a belt feeder, then by a conveyor to stockpile or overhead bin. Hopper cars may also discharge into unloading pits for handling by crane or into receiving hoppers of inclined or vertical elevators carrying the materials to overhead storage.

Delivery by truck is the simplest operation. Trucks discharge at the side of stockpiles, into unloading pits for crane handling, into receiving hoppers of conveyors or elevators and by ramp directly into overhead bin compartments. Aggregates are moved from stockpile by front end loaders and cranes to receiving hoppers of elevators and conveyors, by cranes direct to overhead storage compartments or by a belt conveyor tunnel operation in which remotely controlled gates, located on the roof of the tunnel at selected points, feed aggregates to the tunnel conveyor which discharges into the hopper of an inclined conveyor charging overhead bins.

Many large plants are set up so that aggregates in ground storage feed directly into a tunnel conveyor system. Such a system has been used on a number of federal projects. Economically, it is a most sound practice. Its possible weakness is from a quality standpoint. There may be no choice of selectivity over the aggregates. What happens when you get a bad carload? Such an installation should only be considered when aggregates are uniformly well graded and moisture content runs quite consistent.

For elevating aggregates, the crane and the bucket (belting or chain) elevator are preferred at small or medium sized plants. The elevator is the cheaper unit, both in initial cost and in operation. The crane is a more flexible piece of equipment, can do other work and is easier to replace promptly. Down time is apt to be a



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more serious problem with the elevator. If plant operations require that 250 or more tons be stored in overhead bins, the inclined conveyor is the best choice. The conveyor is a dependable unit capable of elevating aggregates speedily and economically.

Many small plants use packaged cement which is delivered by either box car or truck. Most sizable plants are set up for bulk deliveries. There are a few isolated cases of barge shipments. Rail deliveries are made in box cars, hoppered-bottom cars and air-activated containers. Cement is unloaded into receiving hoppers of screw conveyors, elevators, pumps or air-activated units. Truck delivery of bulk cement is generally made in either screw conveyor units or in "air tanks" to similar receiving hoppers. Air-activated containers are

**All controls in this central-mixing plant operated by the author are in one spot, convenient to the operator. Note slump and additive meters at left center**

also used in truck shipments. Enclosed bucket elevators are principally used to move the cement to storage. A limited number of plants use pumps or vertical screw conveyors for this purpose.

When buying elevating equipment, observe certain fundamentals:

1. Select elevating equipment honestly rated to handle 50 percent more than estimated plant capacity. At too many plants elevating equipment is a permanent bottleneck on big production days.
2. Purchase standardized equipment from reliable manufacturers.
3. Buy equipment that has earned the approval of other operators.
4. Avoid buying units on the proposition that only such equipment meets delivery requirements for plant erection.
5. Purchase equipment for which standard replacement parts are available.
6. Buy units built to stand up under the rugged operating demands of our industry.
7. Take no chances! In the long run, top quality is more important than a low price.

Provisions for overhead storage of aggregates and cement should be governed by accessability of materials, capacities of the elevating equipment and expected hourly production of the plant. From the overhead bins aggregates must be made promptly available for each operating cycle. Bins must be divided into sufficient number of compartments to handle specified sizes of aggregates. There should be minimum provisions for at least three aggregates. In large urban areas, big overhead bins should be divided into four or more compartments. Aggregates should flow swiftly with a minimum of segregation. Each compartment should have two fast operating bottom discharge gates. Position of compartments should be tailored to requirements of the elevating equipment. A circular or octagonal bin, fed from a turnhead, is ideal for a conveyor or elevator, impractical for a crane. For the latter, a compartment-in-line bin is preferred and compartment sides should be far enough apart so as not to hinder operations of the material handling bucket. At plants where rail shipments are elevated directly to bins, compartments should be large enough to handle at least 90 tons. Sides of compartments should slope to the discharge gates at an angle of not less than 50 deg.

Cement is ordinarly stored in overhead steel bins. In a number of installations, auxiliary ground storage bins are also used. Bulk cement bins (as well as elevators and conveyors) should be both watertight and weathertight, with sides sloping to the discharge gate at a 60 deg. angle. The roof should be slanted and should contain a manhole and an air vent. Air units should be used to activate the cement, keep it moving and avoid bridging. A bin indicator should "red flag" to operating personnel that supplies are dwindling. The bin should be compartmentalized to handle different makes, several types or both standard and air-entraining cements.

Weigh hoppers are of many types, shapes and sizes. They may be operated manually, semi-automatically or automatically. Operating controls may be at the side of the unit, or, in the interest of production efficiency, placed at a lower floor level. One single compartment hopper and scale may be provided for the cement. A separate hopper and scale may be used for each aggregate and the cement. At a central-mixing plant provision should be made to "ribbon feed" materials into the mixer. At transit-mixing operations where the matter of cement balls can become a most serious problem, the planned sequence of charging and discharging may have to be completely changed.

The weigh hopper should be so shaped and positioned as to take materials from the storage bins in the fastest, most effective manner and to discharge the load completely (without the use of vibrators) in a matter of seconds. The weigh hopper should be of sufficient size to handle in one batching operation a full load for the biggest hauling unit that might be put in service.

At a central-mixing operation, the weigh hopper and the charging chute of the mixer should be so related as to occupy the least amount of vertical space. Whenever practical, the weigh hopper should be designed so that it will also function as the charging chute, thereby permitting a reduction in over-all plant height.

Do not plan on gravity to charge the cement weigh hopper. When charging by gravity, accurate weighing is practically an impossibility. A screw conveyor powered by a two-speed (regular and dribble feed) motor is most widely used. Recently, Airslides have come into common use. The unit that you select should be fast, dependable, quiet and as dust-free as possible. If the cement bin is divided into two compartments, provide two conveying units. When attempting to handle two cements with one conveyor, cement contamination is certain. To assure top weighing efficiency, provision should be made for automatic cut-off.

Fast acting, accurate, durable scales should be selected that are capable of weighing out a complete mixer load within a tolerance of 1 percent. Cement scales can be either the beam, with an over and under indicator, or the dial type. Aggregate scale can be beam, dial or combination. Without the use of an over and under indicator the beam type is not sufficiently accurate. Combination scales should have the weighing mechanism reversed so that the cut-off occurs at zero. At many large plants, a semi-automatic operation stops the flow of material when the predetermined weight is reached. Scale capacities should correspond to hopper and mixer sizes. Too small capacity necessitates double weighing of batches. Too great capacity sacrifices accuracy.

Producers planning new operations in urban areas should face the possibility that some day fly ash may be commonly used in ready-mixed concrete. Because of the fineness of this material, adjustments are necessary in elevating, storage and batching equipment. Changes required are of sufficient importance that the best technical knowledge on this eventuality should be obtained before such final decisions are made on plant equipment.

Select new bin and batching equipment that will do the job efficiently, fit easily into the contemplated plant layout, permit a future expansion program, and otherwise stand the test of time. Compare advantages and dis-

*(Continued on page 194)*

# Western Concrete Pipe Association Holds Fall Meeting

WESTERN CONCRETE PIPE ASSOCIATION held its annual fall meeting at the Davenport Hotel, Spokane, Wash., October 1-4, 1952, with a representative group of producers from all parts of the West in attendance.

At the board of directors' meeting, an advertising budget of $6000 was approved for the 1953 advertising program, to be equally distributed in western trade journals for advertisements relative to culverts, sewers and storm drains, and in western farm journals, with advertising covering irrigation and drain tile. The association's new field engineer, Ephraim Dyer, Jr., who has visited nearly all pipe manufacturers in the western states since his appointment in April, 1952, made a report of his activities. It was reported that a cataloged reference library is being compiled in the Fresno, Calif., office so that members may be supplied with information on subjects of interest to the industry. A suggestion to furnish members with a certificate of membership was also approved at the directors' meeting.

Open meetings, held on Thursday and Friday, featured a number of reports and speakers. President H. W. Chutter reported that since the publication of the association's first directory in July, 1951, 24 new active and 12 new associate members had been added. Mr. Dyer presented a paper on "Sprinkler Irrigation Systems" which, at the request of those present, is to be mimeographed and distributed to the membership.

Prof. J. E. Christiansen, dean of the School of Engineering and Technology, Utah State College, discussed his investigations of wire-wrapping concrete irrigation pipe for increased resistance to internal hydrostatic pressures. The irrigation pipe producers present expressed considerable interest in the possibility of this method for wrapping small diameter non-reinforced pipe for use in mains for sprinkler irrigation.

An associate member, W. Thomas Pease, Monterey Park, Calif., presented an interesting and informative paper on "Steam Curing Concrete Pipe," which also will be mimographed and sent to members.

C. M. Howard, manager of the Concrete Products Association of Washington, reviewed the activities of his association, which includes manufacturers of concrete pipe, concrete masonry and other concrete products. Proposed changes in A.S.T.M. specifications were also discussed with considerable difference of opinion being expressed as to the advisability of substituting the "fill test" for the hydrostatic test in C-14. Some opposition was expressed to the inclusion of heavy wall tongue and groove pipe in C-14 rather than in C-75. The suggestion that concrete drain tile be included in C-118 was unanimously approved.

The Friday morning session was devoted to an open forum for discussion of various industry problems, led by a panel consisting of Hugh P. Ford, chairman; John W. Ash, Sr.; A. B. Metcalf; Fred Spiekerman; and Ward Hughes.

At the Friday afternoon session, guest speakers included: Robert E. Tobin, Portland Cement Association, who spoke on "Concrete Pipe, Past, Present and Future"; John A. Roberson, Washington State College, who spoke on "Studies on Breakage of Concrete Irrigation Pipe"; and H. A. Parker, U.S. Bureau of Reclamation, on "Development of the Columbia Basin."

Social activities included a cocktail party, dinner, floor show and dance on Friday evening, and a trip to Coulee Dam on Saturday. Before adjournment, it was voted that the association's annual meeting would be held just preceding or following the annual meeting of the American Concrete Pipe Association at Dallas, Texas, February 26-28, 1953.

REGISTRATIONS

Producers:

John W. Ash, Sr., Builders Supply Co., Corvallis, Ore.
John W. Ash, Jr., Builders Supply Co., Corvallis, Ore.
Harold Baker, Peerless Concrete Pipe Co., Yuma, Ariz.
Jess Blaker, Turlock Concrete Pipe Co., Turlock, Calif.
H. W. Chutter, Jourdan Concrete Pipe Co., Fresno, Calif.
A. W. G. Clark, B. C. Concrete Co., Ltd., Vancouver, B.C.
J. G. Collins, Collins Concrete & Steel Pipe Co., Portland, Ore.
M. W. Crouch, Peerless Concrete Pipe Corp., Santa Ana, Calif.
E. H. Drinkgern, Peerless Concrete Pipe Corp., Santa Ana, Calif.
George Duecy, Associated Sand & Gravel Co., Everett, Wash.
Earl H. Eby, Elk River Concrete Products Co., Helena, Mont.
Casey Fannin, Tellyer Pipe Co. of Texas, Odessa, Texas
Hugh P. Ford, Eugene Concrete Pipe & Products Co., Eugene, Ore.
France Geary, American Pipe & Construction Co., Oakland, Calif.
A. A. Gehrke, Montana Concrete Pipe Co., Great Falls, Mont.
H. O. Hilfiker, Hilfiker Concrete Pipe Co., Eureka, Calif.
O. M. Hooper, Hooper Concrete Pipe Co., Phoenix, Ariz.
Ward W. Hughes, Concrete Conduit Co., Lindsay, Calif.
John Hutsell, Associated Sand & Gravel Co., Everett, Wash.
G. R. Jessen, Idaho Concrete Pipe Co., Salt Lake City, Utah
Robert E. Jose, Union Concrete Pipe Co., Parker, Wash.
Walter J. Lenz, S. Lenz & Son, St. Helena, Calif.
Fred N. Linn, United Concrete Pipe Corp., Modesto, Calif.
Francis Mangine, Visalia Concrete Pipe Co., Visalia, Calif.
Thomas McClain, Utah Concrete Pipe Co., Provo, Utah
R. J. McConnell, American Pipe & Construction Co., Los Angeles, Calif.
E. E. McCormack, The McCormack ... Hillsboro, Ore.
Brown Metcalf, Columbia Concrete Pipe ... Wenatchee, Wash.
Peter Pendrey, Idaho Concrete Pipe Co., Nampa, Idaho
Cal Peyton, Peyton & Co., Klamath Falls, Ore.
W. B. Pittman, United Concrete Pipe Corp., San Jose, Calif.
R. R. Reynolds, Van Cleve Construction Co., Exeter, Calif.
D. F. Robbins, Gleneden Brick & Tile Works, Gleneden Beach, Ore.
William S. Rogers, Rogers Materials Co., Madera, Calif.
Glen W. Schultz, Spokane Concrete Pipe Co., Spokane, Wash.
John R. Sherman, Yakima Cement Products Co., Yakima, Wash.
R. D. Slater, Oregon Gravel Co., Salem, Ore.
F. H. Souther, Sunnyside Concrete Pipe Co., Sunnyside, Wash.
W. H. Souther, Sunnyside Concrete Pipe Co., Sunnyside, Wash.
Fred Spiekerman, Ed Spiekerm... Pipe Co., Lodi, Calif.
Harold Vaughn, United Concrete Pipe Corp., McFarland, Calif.
Charles E. Walters, Spokane Concrete Pipe Co., Spokane, Wash.
Charles E. Ward, Utah Concrete Pipe Co., Ogden, Utah
Marion A. Ward, Clarke Concrete Construction Co., Idaho Falls, Idaho
Carl B. Warren, Spokane Concrete Pipe Co., Spokane, Wash.
J. A. Warren, Montana Concrete Pipe Co., Missoula, Mont.
C. V. Whalley, California Concrete Products Co., San Jose, Calif.
W. R. White, W. R. White Co., Ogden, Utah

Associate members:

Walter J. Ashton, Waterman Industries, Inc., Exeter, Calif.
Jack Dorris, Cen-Vi-Ro Manufacturing Co., Nampa, Idaho.
Ephraim Dyer, Jr., Western Concrete Pipe Association, Fresno, Calif.
Fred W. Hansen, California Wire Cloth Corp., San Francisco, Calif.
Jack Jansse, Permanente Cement Co., Oakland, Calif.
George E. Kellar, Kellar Valves, Coachella, Calif.
William J. MacKenzie, Tuerck-MacKenzie Co., Portland, Ore.
L. R. McNett, Permanente Cement Co., Seattle, Wash.
Wallace Palmateer, Martin Iron Works, Ltd., Los Angeles, Calif.
Monroe Park, Permanente Cement Co., Fresno, Calif.
T. K. Partridge, Southwestern Portland Cement Co., Los Angeles, Calif.
W. Thomas Pease, Concrete Pipe Equipment, Monterey Park, Calif.
O. R. Showalter, Showalter's Irrigation Appliances, Fresno, Calif.
George Skarich, California Wire Cloth Corp., Seattle, Wash.
Ben E. Teschner, Monolith Portland Cement Co., Los Angeles, Calif.
R. C. Woods, Woods Equipment Co., Indio, Calif.

Guests:

R. L. Allbrook, Washington State College, Pullman, Wash.
Ralph Britson, Lehigh Portland Cement Co., Spokane, Wash.
J. E. Christiansen, Utah State Agricultural College, Logan, Utah
C. M. Howard, Concrete Products Association of Washington, Seattle, Wash.
J. E. Jellick, Portland Cement Information Bureau, San Francisco, Calif.
Roy Neill, Spokane Portland Cement Co., Spokane, Wash.
H. A. Parker, U.S. Bureau of Reclamation, Ephrata, Wash.
John Roberson, Washington State College, Pullman, Wash.
Robert E. Tobin, Portland Cement Association, Spokane, Wash.
Tracy W. Walnich, Colorado Fuel & Iron Corp., Spokane, Wash.

## Ready-Mix Expansion

ANDREWS CONCRETE CO., Mason City, Iowa, has increased its equipment to a 600 cu. yd. per day capacity at the Mason City plant and a 300 cu. yd. capacity at its Clear Lake plant. Two-way radio communication is maintained between the plants and the trucks. The company has a Mixermobile unit for elevating concrete, as a special service to customers.

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**Adams Concrete Products Co. uses effective selling methods in making Durham, N.C., a thriving market for concrete masonry**

General view of the new plant and storage yard

# Breaking Into a Tough Market

A PROGRAM OF intelligent and aggressive salesmanship is changing Durham, N.C., from a city that was not concrete masonry conscious to one that recognizes the many possibilities offered by concrete units.

Durham, a manufacturing center with textile and tobacco processing plants, lagged far behind other cities with the same population as regards concrete masonry construction. In contrast, Raleigh, N.C., only 23 miles away, supports a large concrete block industry.

To the Adams family, which operates a thriving concrete products business at Fuquay-Varina near Raleigh, the city of Durham presented an opportunity to sell concrete block and at the same time not take any business away from plants already within the city. To meet this challenge, the Durham Concrete Products Co. was formed. Later the name was changed to Adams Concrete Products Co., and a new plant was built at the western edge of the city.

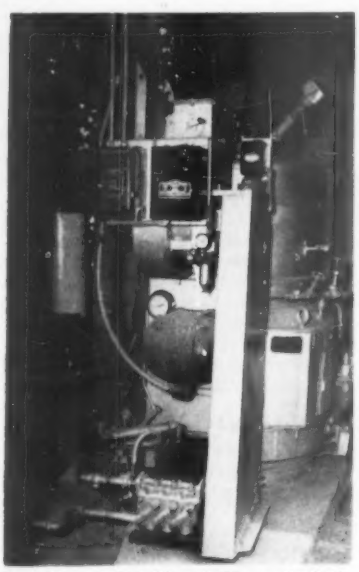
Recognizing that there was a big selling job to be done in Durham, the company employed a full time salesman, with the Adams brothers also taking an active part in the promotion of concrete masonry construction. Dealer accounts have been established in the neighboring areas.

Building inspectors, engineers, architects, contractors and masons had to be converted, generally speaking, to the use of concrete block. Much of this missionary work was done simply by showing the individual good examples of concrete masonry practice in near-by Fuquay-Varina and Raleigh. An afternoon trip and the inspection of a dozen or more well-constructed concrete masonry structures was usually sufficient to get a sales toehold.

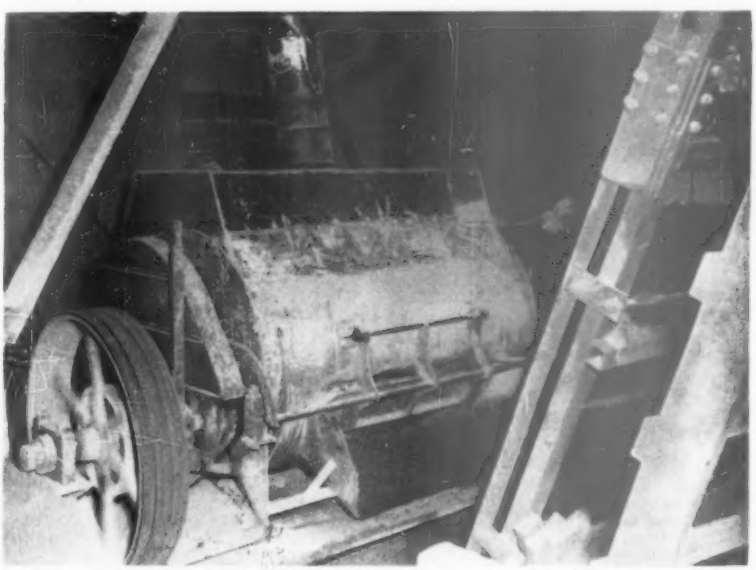
Much of the new business rounded up by the Adams brothers was in the home and small apartment fields. If a prospective home builder was contacted, one or more of the masons who do the actual work entered the sales picture. Adams Concrete Products Co. keeps in contact with ten or more masons who are partial to concrete block, for they make their living laying them. Surprisingly enough, this group includes several college graduates with various types of degrees. The prospective home builder is placed in contact with one of these men and the net result is usually the order, for they too can show the interested parties many examples of good concrete masonry construction practice.

It all sounds easy and simple but behind it is a lot of hard work and a planned merchandising program.

*(Continued on page 195)*



Four kilns, each holding 2500 standard 8's, are supplied low pressure steam by this unit



The 50-cu. ft. mixer discharges to a skip serving the block machine. The mixer is totally enclosed to reduce dusting. Aggregates are handled to and from the storage system by belt conveyor

# Concrete Convention and Exposition Scheduled for January

THE 33RD ANNUAL convention of the National Concrete Masonry Association and the eighth biennial Concrete Industries Exposition will be held concurrently in the Cleveland Public Auditorium, Cleveland, Ohio, January 26-29, 1953. Attendance is expected to be even greater than during the record convention-exhibition years of 1949 and 1951. Concrete products manufacturers and ready-mixed concrete producers will be able to study and compare what is claimed will be the greatest array of equipment and materials ever assembled for an exhibit. Many new pieces of equipment for both industries will make their "debut" at the 1953 show.

National Concrete Masonry Association announces that it will have many new and interesting features on its convention program. One new feature will be a six-man panel discussion on subjects of mutual interest to block producers and mason contractors. Three block producers and three mason contractors, from important and widely separated parts of the country, will form the panel under the chairmanship of A. C. Streblow, N.C.M.A. president.

The promotional session, in addition to a report by W. P. Markert, N.C.M.A.'s director of promotion, will feature addresses and question periods by several of the country's leading marketing experts. Another feature will be the showing of a new film on sales promotion techniques.

The technical sessions on the third and fourth days of the convention will feature a report by R. E. Copeland, N.C.M.A.'s director of engineering; a session on "good housekeeping around block plants"; the outlining of a practical accident prevention program; and a detailed report on the building program of the Corps of Engineers. A new feature will be a "stump the experts" panel discussion.

As in the past, convention sessions will be held in the mornings and the Concrete Industries Exposition will be open in the afternoons, to allow everyone to participate fully in both affairs.

## Exhibitors in the 1953 Concrete Industries Exposition (as of October 22, 1953)

Solvay Sales Division
Allied Chemical & Dye Corp.
New York, N.Y.

Bergen Machine & Tool Co.
Nutley, N.J.

Besser Manufacturing Co.
Alpena, Mich.

Blaw-Knox Co.
Pittsburgh, Penn.

Wm. Bros Boiler & Mfg. Co.
Minneapolis, Minn.

L. Burmeister Co.
Milwaukee, Wis.

Burns & Russell Co.
Baltimore, Md.

Butler Bin Co.
Waukesha, Wis.

Calcium Chloride Institute
Washington, D.C.

Dur-O-waL Division
Cedar Rapids Block Co.
Cedar Rapids, Iowa

Celocrete Division
The Celotex Corp.
Chicago, Ill.

Chain Belt Co.
Milwaukee, Wis.

Cleveland Vibrator Co.
Cleveland, Ohio

Clipper Manufacturing Co.
Kansas City, Mo.

Columbia Machine Works
Vancouver, Wash.

*Concrete* Magazine
Chicago, Ill.

Concrete Transport Mixer Co.
St. Louis, Mo.

Construction Machinery Co.
Waterloo, Iowa

Cook Bros. Equipment Co.
Los Angeles, Calif.

Erickson Power Lift Trucks, Inc.
Minneapolis, Minn.

Fleming Manufacturing Co.
Cuba, Mo.

Flexicore Co., Inc.
Dayton, Ohio

General Engines Co., Inc.
Gloucester City, N.J.

Heltzel Steel Form & Iron Co.
Warren, Ohio

Jaeger Machine Co.
Columbus, Ohio

C. S. Johnson Co.
Champaign, Ill.

J. A. Jones Concrete Machy. Co.
Pittsburgh, Penn.

Kent Machine Co.
Cuyahoga Falls, Ohio

Klingelhofer Machine Tool Co.
Kenilworth, N.J.

Knickerbocker Co.
Jackson, Mich.

Kwik-Mix Co.
Port Washington, Wis.

Lith-I-Bar Co.
Holland, Mich.

Littleford Bros., Inc.
Cincinnati, Ohio

J. F. Malane
Detroit, Mich.

Master Builders Co.
Cleveland, Ohio

Maxon Construction Co.
Dayton, Ohio

Medusa Portland Cement Co.
Cleveland, Ohio

Memphis Equipment Co.
Memphis, Tenn.

Multiplex Machinery Corp.
Elmore, Ohio

Gene Olsen Corp.
Adrian, Mich.

Oswalt Engineering Service Corp.
Forest Park, Ill.

*Pit & Quarry*
Chicago, Ill.

Portland Cement Association
Chicago, Ill.

Prime Mover Co.
Muscatine, Iowa

Arthur Rehberger & Son, Inc.
Newark, N.J.

ROCK PRODUCTS
Chicago, Ill.

Shore Engineering
New York, N.Y.

W. W. Sly Mfg. Co.
Cleveland, Ohio

T. L. Smith Co.
Milwaukee, Wis.

Split Rock Products Co.
Wauwatosa, Wis.

Spray-O-Bond Co.
Milwaukee, Wis.

Standard Dry Wall Products Co.
New Eagle, Penn.

Stearns Manufacturing Co.
Adrian, Mich.

Towmotor Corp.
Cleveland, Ohio

Tracto-Lift Co.
Kansas City, Mo.

Transmission & Gear Co.
Dearborn, Mich.

Truax Machine & Tool Co.
Seattle, Wash.

Universal Door Carrier, Inc.
Indianapolis, Ind.

White Motor Co.
Cleveland, Ohio

Worthington Corp.
Plainfield, N.J.

## C.M.M.A. Publication

CONCRETE MASONRY MANUFACTURERS ASSOCIATION distributed approximately 20,000 souvenir copies of the September, 1952, issue of *Concrete Masonry Review*, to interested visitors attending the Los Angeles County Fair and the "Fair Within a Fair" exhibit in the C.M.M.A. building, September 12-28.

This special souvenir issue was replete with basic and general information concerning concrete masonry and allied products construction, with all editorial material directed toward general public readership, as opposed to standard issuance where news is primarily of industry interest.

The *Concrete Masonry Review* is the new, official, monthly publication of C.M.M.A. The editorial staff consists of J. Richard Iander, publisher-editor; John G. Wurtz, Jr., associate editor; E. P. Ripley, advising editor; and Clif Hendrickson, C.M.M.A. editor. The editorial board consists of experts in their respective fields, selected from the C.M.M.A. membership, and includes: Robert Blair and M. A. Garrison, Jr., cement; Stanley E. Johnson, concrete block; J. T. Helsley and Eugene Henry, admixtures; Leo Howard and John S. Dimmick, concrete specialties; L. Glen Switzer and Farrell Barber, aggregates; John S. Badzik, paints and water-proofing; William A. Grindle and Harley Lyon, construction; Albyn Mackintosh, engineering; R. P. Yager, equipment; and William W. Wyman and Vincent Palmer, architecture.

As the title of the magazine suggests, this C.M.M.A. publication reviews the various phases of the industry and related subjects. It features news of association activities and accomplishments of various masonry producers, accompanied by many pictures and illustrations. Its interesting and informative subject matter is designed primarily for service to masonry manufacturers, building material dealers, architects and contractors. The association and its editorial staff and board are to be commended and congratulated on the excellent quality of their magazine.

## Concrete Firm Expands

SEPPI BROTHERS, Virginia, Minn., has recently expanded its building supply business to include a modern ready-mixed concrete plant.



UNIVERSITY OF MICHIGAN LIBRARIES

# FORUM
## ON CURING CONCRETE PRODUCTS

conducted by
WILLIAM J. SHORE

**Question**

We are constructing a steam room for curing concrete block and have some questions regarding the proper method of applying steam. We are using a low pressure (11 p.s.i.) 10-hp. boiler that uses a 2½-gal. nozzle for oil. The steam room is 7½ x 8½ x 60 ft.; it is constructed of 8- x 8- x 16-in. block and has a 4 in. thick cinder concrete roof. The questions are:

1. What size of pipe should be used between the boiler and steam room?
2. What size of orifices should be used in the steam room?
3. Where should admittance orifices be placed in the steam room—bottom, middle or top of room?
4. What is the best method of determining moisture balance between curing block and the steam room?
5. What is the length of time required to reach curing temperature with this set-up?

**Answer**

*Question 1:* If the run from boiler outlet to steam discharge outlet in the kiln is 15 ft. or less, install 1½-in. pipe; if the run is between 15 and 50 ft., install 2-in. pipe; and if the run is over 50 ft., install 2½-in. pipe. Where the steam pipe is outside the kiln, cover with standard 85 percent magnesia pipe insulation and wrap roofing felt around it to protect against water.

The combination of properly sized pipe and pipe insulation reduces condensation of steam and reduces pressure drop to minimum values.

*Question 2:* We recommend only one orifice per kiln. If the pressure at or close to the discharge orifice is 10 p.s.i., make the orifice a circular opening with a diameter of $\frac{13}{16}$ in. For lower pressures, the orifice should be larger.

*Question 3:* The admittance orifice should discharge steam parallel to the floor and toward the front of the kiln. The center of the discharge orifice should be 2 in. from the floor. The orifice should be adjacent to the rear wall, equidistant from each of the two walls.

*Question 4:* This question is not entirely clear. In general, there is no need for determining what is called "moisture balance" when heat is supplied entirely by live steam. Humidity under these conditions is usually sufficiently high to prevent loss of moisture from block.

*Question 5:* Assuming that all block are loaded in only one kiln, that there are about 1440 block per kiln load, that boiler steam pressure right at the orifice is 10 p.s.i., and that the boiler delivers continuously 10 boiler hp. or 300 lb. of steam per hr.—then, under average temperatures near 70 deg. F. in the surrounding outside, it will require 10 hr. to reach proper steam curing temperature. In cold weather it takes longer, in hot weather it takes less time.

However, we believe it important to call attention to other factors which have a bearing on this problem and which have not been mentioned.

The boiler notation indicates a 10-hp. boiler and an oil nozzle with a burning capacity of 2½ gal. of fuel oil per hr. A nozzle that can burn only 2½ gal. of oil per hr. cannot produce, in a boiler of this type, more than 7 boiler hp. It is therefore necessary to replace this nozzle with one that burns 4 gal. per hr. to produce 10 boiler hp. It is suggested that control for pressure be set at 12 lb. "off" and 10 lb. "on," keeping the differential as small as possible.

We suggest that a thermometer be installed to indicate the temperature inside the kiln during the steam curing cycle. A thermometer is of great assistance in determining the exact length of time steam should be kept on and shows when it is time to shut off steam.

In the event that you still have a choice for location of the boiler and construction of the kiln, we submit Fig. 1, indicating what we consider the most efficient curing kiln layout. There are two kilns, each 7½ ft. high, 8½ ft. wide and 30 ft. long on the inside.

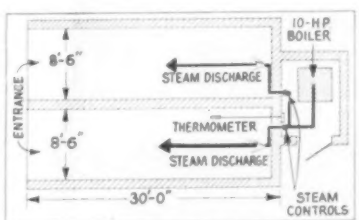



**Fig. 1: Suggested kiln layout**

Each kiln may be loaded in 4 hr. Work starts at 8 a.m. and kiln No. 1 is loaded at 12 noon; steam is then turned on. Work starts after lunch at 1 p.m. and kiln No. 2 is loaded at 5 p.m. Steam is shut off on kiln No. 1 and turned on at Kiln No. 2. Steam is turned off at 10 p.m. Both kilns are emptied the following morning a little before 8 a.m.

The boiler is located at the rear of the kilns, between both, with practically no steam pipe to be run and no loss of pressure or steam condenses.

A 4-in. roof of cinder concrete is rather light for cold weather and there will be difficulty in reaching top heat during winter. Additional insulation may be installed on top of the kiln, or under the roof inside the kiln. We prefer insulation on the inside.

**Question**

We are making a variety of concrete brick. These are approximately 11½ x 5½ x 4 in.; they have two openings instead of the three in conventional block. They weigh about 11 lb. each and through addition of mineral pigments are produced in varying shades of different colors.

We employ a high pressure steam curing system where steam is delivered to the kilns at a temperature of about 330 deg. F. Our brick reach a temperature of 160 deg. F. about three hours from the time steam is turned on and admitted to kilns.

For a long time we have suspected that this high temperature steam exerts a bleaching action on the brick proper. To make certain of this, we took one rack of fresh brick, covered the rack with a tarpaulin and allowed these brick to cure at 70 deg. F. under fog conditions. We found the following interesting results:

(a) The fog cured brick did not have the same strength the following morning as the steam cured brick. However, in a matter of seven days after manufacture, the strength difference was trifling.

(b) The color of the fog cured brick was definitely darker than that of the steam cured brick.

(c) In subsequent tests and operations, we found that to obtain a desired shade of color, it took 3 lb. of pigment with fog curing and 8 lb. of pigment with steam curing.

We would like to have your comments on this problem. We like the high strength attained with steam curing, but we do not enjoy spending twice as much for color pigments.

**Answer**

There is no doubt that one of the prominent effects of steam curing, using high temperature steam at high pressure, is that of bleaching. The cement itself turns a lighter shade of color.

In the concrete and cinder block field, this is considered an advantage. A lighter and brighter colored block makes a more pleasing looking masonry structure, whether it be a wall or a house or structure. Where block are exposed to view, consumers enjoy this brighter color. In the case of concrete brick made in varying shades of different color, this bleaching effect becomes a source of extra cost to the brick maker, and consequently is to be avoided as much as possible.

We make the following recommendations, and suggest that you try putting them into effect.

(a) We believe the temperature of 160 deg. F. to which you bring the brick is too high for a sand, gravel, cement product. We have found that a temperature of 130 deg. F. is sufficient in most instances to provide strength enough to remove brick from pallets and cube them. We therefore suggest that you limit top heat for brick to 130 deg. F.

(b) Operating at this lower temperature reduces the bleaching effect,

*(Continued on page 191)*

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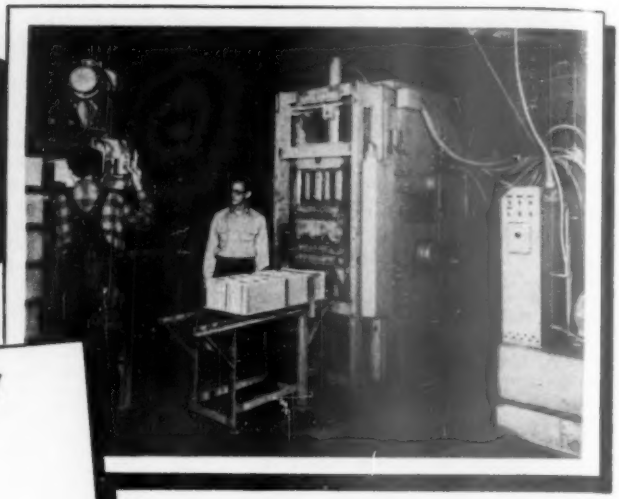
# Blockmaster Best Buy

## FOR THIS DENVER OPERATOR



VIBRATED CONCRETE COMPANY

PHONE TAbor 7707 ● 38TH AND WYNKOOP STREETS

DENVER 5, COLORADO

Multiplex Machinery Corporation April 7, 1952

Elmore, Ohio

Gentlemen:

We are happy to send you the enclosed order for our second Blockmaster machine, together with mold boxes, pallets and racks, as specified.

We want you to know that we are very much pleased with our first Blockmaster, which has been operating for six months now and has more than satisfied us. We are convinced that two of these machines will really do wonders for us.

Anything you can do to speed delivery of the new machine will be much appreciated.

Very truly yours,
VIBRATED CONCRETE COMPANY
Don Wheelock

Don Wheelock

Vibrated Concrete Company of Denver likes fast production of top quality block because it means greater profits. It's as simple as that. Finding their competitive position so improved with their first Multico Blockmaster No. 2 (pictured above) they want another as quickly as possible.

Both the Blockmaster No. 2 (2 blocks per cycle) and the Blockmaster No. 3 (3 blocks per cycle) are fully automatic machines, requiring labor only to offbear the block. They are hydraulically powered by a separate power unit which can also serve future machines. Machine action is smooth and quiet, and as the Blockmasters have 50% fewer moving parts than other machines, costly maintenance is kept at an absolute minimum.

The Blockmasters have an unbeatable compression action, producing perfect blocks. With their plain pallets they produce any size or style of block, with any aggregate.

These up-to-date, proven machines can help you too; write or call Multiplex for more information.

**Multiplex Machinery Company has been making concrete production machinery for over 40 years. Our engineers will help you plan your plant expansion. We can show you how Multiplex automatic block machines, mixers, skip hoists, and compartment aggregate bins can make your operations more profitable.**

**Left: the Multico Blockmaster No. 3. Choose this hydraulically powered machine for modern, high production performance.**

# MULTIPLEX MACHINERY COMPANY

**DIVISION OF MULTIPACK, INC. ● ELMORE, OHIO**

especially since this bleaching effect becomes more pronounced at temperatures over 130 deg. F.

(c) We suggest that the steam supply to kilns be reduced so that the temperature of 130 deg. F. is reached in a matter of 12 to 14 hr. from the time steam is turned on.

In this manner we reduce the bleaching effect. It is true that we may not have the same early strength in the block, but the strength attained will be more than sufficient to permit easy and efficient handling and cubing.

## Developing a Big Business

*(Continued from page 179)*

ern masonry home for himself and gave the public a carte blanche bid to come and see the job at any time. At the formal opening more than 3500 people came to see the house. Another house of differing architectural treatment was also used for educating the public on the virtues of low cost, fireproof, permanent concrete construction. The company has a record of 15 houses that have been built as a result of this promotion; how many more were built without coming to their attention is anyone's guess.

President Spaeth and sales manager Morgan each have new concrete masonry homes underway. The public will be kept informed of the building progress and urged to come out and visit the jobs. Seeing is believing and no better way of selling has been thus far discovered.

All of this symposium of planning leads to the inevitable conclusion that the future of concrete manufacture belongs to those who look ahead. The growth of Salina Concrete Products, Inc., is another reminder of the great opportunities that exist everywhere for the concrete industry granted that good planning and initiative are given a free hand.

## Milwaukee Adopts Modular Block

THE CONCRETE MASONRY Industry of Milwaukee, Wis., recently passed a resolution stipulating that, effective December 1, 1952, Milwaukee manufacturers will change the height of the block they produce from 8 in. to modular sizes.

Officers of the Milwaukee masonry group are Edwin B. Bartlett, Jr., president; Bruno Garni, vice-president; and Otto Ladwig, Jr., secretary-treasurer.

●

GERRIT LOKKER, superintendent of the W. E. Dunn Manufacturing Co., Holland, Mich., died recently at the age of 56. He had been ill for several months. Mr. Lokker was well known in the concrete masonry industry and had been associated with the Dunn Mfg. Co. for more than 30 years.


# the most valuable thing on your truck mixers

The Bureau Rating Plate (1) Assures acceptance of your equipment by architects and engineers, (2) Protects you against obsolescence and departure from quality standards which have won for ready mixed concrete a market now exceeding $500,000,000 a year, (3) Entitles you to call on the unequalled experience of Bureau members to answer your technical or other problems.

(Advertisement below is being read by your best customers in Architectural Record, Engineering News Record, Western Construction and Southwest Builder.)

Walnut Lane Bridge, Philadelphia. First major pre-stressed concrete bridge in the U.S.

## Why do you admire this bridge?

The structure you see consists of particles of aggregate and cement, reinforced and, in the girder sections, pre-stressed with steel.

But everything has been so well put together that the eye can no longer separate the design from the material, or its grace from its strength. The whole work is homogeneous.

A like fundamental, never to be overlooked by supervising architects and engineers, is that concrete itself becomes a homogeneous material *only when it has been properly and completely mixed.*

This is why the ready-mixed concrete industry sets exacting standards for mixer design, and certifies to you that truck mixers and agitators, built to those standards, have the proper design, capacity, drum speed and mixing action and the accuracy of water control required to produce a homogeneous concrete of uniform strength.

**Look for this Badge of Dependability on Truck Mixers:** You have a right to insist on this Rating Plate on any truck mixer that serves your jobs. It is available to all who comply with the quality standards established by the National Ready Mixed Concrete Association and the Truck Mixer Manufacturers Bureau.

***These member manufacturers comply with Bureau standards:***

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CHAIN BELT COMPANY, Milwaukee, Wis.
CONCRETE TRANSPORT MIXER CO., St. Louis, Mo.
THE JAEGER MACHINE COMPANY, Columbus, Ohio
THE T. L. SMITH COMPANY, Milwaukee, Wis.
WORTHINGTON PUMP & MACHINERY CORP., Dunellen, N.J.

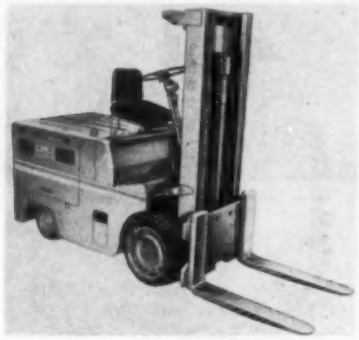
# NEW MACHINERY

## Waterproofing

PHIL-O-SEAL, INC., 6001 W. Washington Blvd., Culver City, Calif., has announced four waterproofing, preservative and fire retardant products. No. 202 for hydrostatic effect treatment is claimed to be effective in preventing alkali and moisture coming out on masonry surfaces due to hydrostatic pressure. No. 303 for masonry surfaces is a water repellent for the treatment of concrete, brick, stone, cement, plaster, tile and other masonry surfaces. Colorless, transparent and invisible when applied, it leaves no after stain and will not change colors of treated materials, according to the manufacturer. It allegedly retards weather effects, and a watertight insulation is formed by the integration and chemical reaction which is beyond surface wear.

## Fork Lift Truck

CLARK EQUIPMENT CO., Industrial Truck Div., Battle Creek, Mich., is now building a 6000- to 7000-lb.



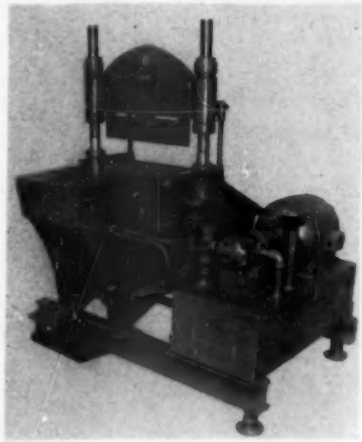
Electric powered fork lift truck

range, gas or electric powered fork lift truck. These new Utilitruc models have a turning radius within the limitations of practical aisle widths. Center-pivoted steering axles, with rubber-mounted bushings and angularly-placed tie-rods to absorb road shocks, are standard on both power types. The trucks are equipped with a new fork mounting and have a "free-lift" of 25 in., and more lift is provided by an upright design which does not increase upright height. The breaking device on the electrical model functions automatically when the driver leaves the seat. The gas model can be equipped with a Dynatork drive or quick change clutch.

Travel speed of the new electric truck has been increased to 6 m.p.h. The lifting speed is 12 to 16 percent faster. A large battery compartment permits the use of a wider range of battery sizes including the 3 x 6 cell arrangement; side removal of the battery speeds servicing. The drive motor and pump are totally enclosed for maximum protection against dust and dirt.

## Block Splitter

COLUMBIA MACHINE WORKS, 107 S. Grand, Vancouver, Wash., has announced the addition of a block splitter to its line of concrete products



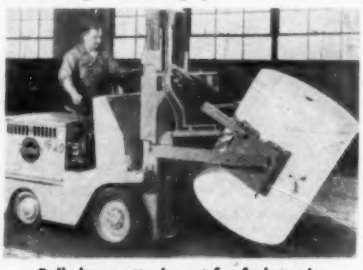
Hydraulically operated block splitter

plant equipment. The hydraulically operated cutting head and spring loaded table make cuttings up to 8 x 16 in. or 8 x 24 in. thicknesses. The splitter can be moved with either a fork lift truck or it can be mounted on wheels.

## Roll Clamp for Fork Trucks

THE BAKER-RAULANG CO., Baker Industrial Truck Div., 1230 W. 80th St., Cleveland 2, Ohio, has developed a detachable roll clamp attachment for fork trucks designed to pick up and stack cylindrical objects either horizontally or vertically. Clamping pressure is controlled by an adjustable relief valve in the hydraulic system, permitting the operator to control clamping pressure for each type of material handled. The clamp is installed on the manufacturer's four-purpose carriage and can be detached in two minutes.

Two men can detach the clamp by removing retaining pins at the base

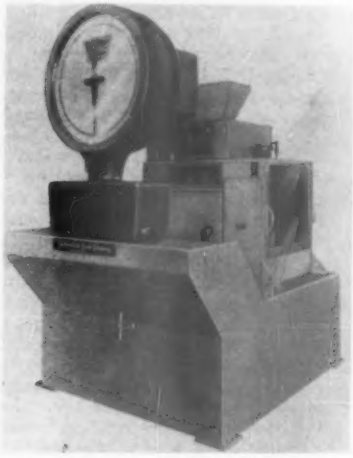


Roll clamp attachment for fork trucks

of the truck carriage, detaching two push-pull Hansen couplings on the clamp's hydraulic line and lifting the clamp off the carriage. Next a set of forks is installed and locked by the retaining pins. The new attachment is available for any Baker fork truck from 1000 to 4000 lb. capacity.

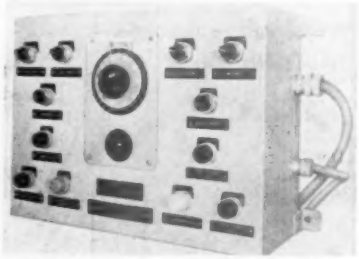
## Automatic Weighing

RICHARDSON SCALE CO., Clifton, N.J., has developed an automatic cumulative and consecutive weighing system through application of a simple servo-mechanism of the type used in processing controls. The new system is called the Select-O-Weigh. It is controlled by an electronic circuit with no arcing contacts. The company's standard type automatic scale is used as the weighing element in the system, with a pendulum dial scale acting as the force-measuring compo-



Automatic scale used in weighing set-up

nent. Control circuits may be so arranged as to provide either (1) delivery of consecutive weights of varying amounts according to a predetermined schedule, or (2) accumula-



Control panel for automatic scale system

tion of a total batch of a pre-selected formula and its discharge to a surge hopper or mixer as a whole. Following discharge of the automatic scale, a tare check circuit is brought into operation to prevent the scale from initiating the next weighing unless all material is cleared from the weigh hopper and the unit is in perfect empty balance. A further elaboration of the system is the operation of repeater dials to indicate remotely the position of each scale pointer.



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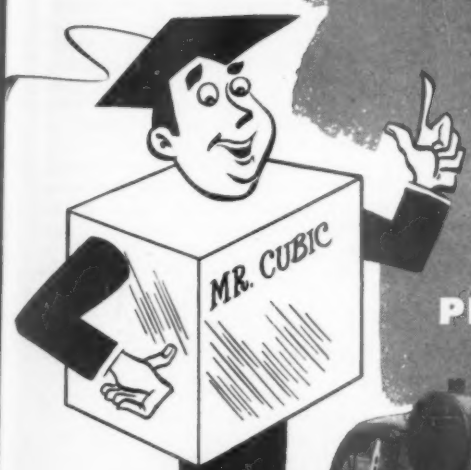

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A new booklet . . . just out . . . entitled "Challenge Sizes" shows you the size truck best suited for your Challenge Mixer . . . how Challenge helps you receive a bigger return on your investment. Send for it today. It's free! Remember, only Challenge has 3, 3½, 4, 5, 6, & 6½ cubic yard size truck mixers, the nation's widest selection . . .

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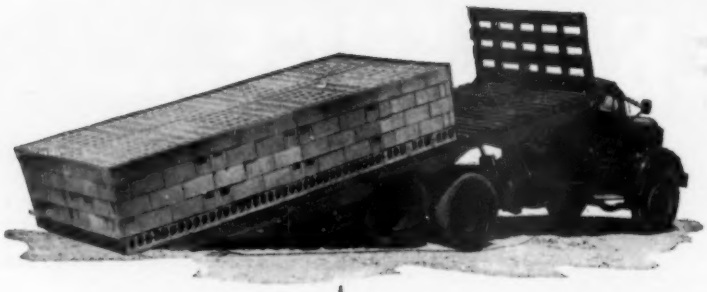

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## A Producer's Views

*(Continued from page 185)*

advantages of competitive equipment. Check specifications of columns, supporting angles and steel plate. Buy skillfully designed and properly constructed equipment from dependable manufacturers. At the time of selecting principal plant equipment, consideration should be given to the possible use of moisture and slump determinants, timing devices, recording instruments and automatic dispensers.

In most areas of the United States, heated concrete must be furnished during a part of each year. Facilities must be planned either to heat water (up to 180 deg. F.) used in concrete or to heat both aggregates and water. Producers should plan heating arrangements so that they can constantly deliver 70 to 80 deg. concrete under coldest operating conditions. In setting up new operations only a modern, efficient, quick-acting packaged heating plant should be considered. The heating unit should have sufficient capacity to operate the water heater, supply steam for bin jets, and provide heat required to keep the storage bin coils functioning efficiently.

In our business the hauling unit is the most important piece of production equipment. We mix as we go. With a majority of producers, processing is a mobile operation. The development of the transit mixer made possible the phenomenal growth of the ready-mixed concrete industry. Although ready-mixed concrete is delivered in agitators, non-agitators and ordinary dump trucks, transit mixing, by a wide margin, is the most popular form of delivery. Of approximately 1700 ready-mixed concrete operations in the United States, at least 70 percent transit mix, approximately 25 percent central mix with deliveries made in agitators, and only a relatively few, less than 5 percent, use non-agitating units with complete processing done at the central-mixing plant.

There are two principal types of transit mixers: (1) revolving drum—both horizontal and high discharge and (2) revolving blade. On the basis of both sales and manufacturer interest, the high discharge mixer of the revolving drum type is easily the most popular unit. Strangely enough, the horizontal is a more efficient mixer.

Central-mixing producers can select any type or types of transit mixers, agitators and non-agitators. A given size transit mixer will handle a 50 percent bigger load when the concrete is premixed. Under some circumstances, even a common dump truck may be pressed into service. Because of this greater flexibility, there has been a recent trend toward central mixing. Many operators who are purchasing batching equipment design their plant layout so that a central mixer can be easily installed.

Tie your plant and delivery operations together. Decide upon the kind, size and number of hauling units. Build a plant that will charge the trucks with a full load on a fast operating cycle. Plan for the future. Make allowances for a reasonable expansion program. By a careful selection of production and delivery equipment, provide operating personnel with efficient tools.

*(To be continued)*

## Breaking a Tough Market

*(Continued from page 187)*

In the case of Adams Concrete Products Co. it has resulted in the new plant running at capacity production. The plant started making block in February of this year.

At Fuquay-Varina, the Adams' company has a modern office made from the plant's output; the brothers have found that this structure was a decided sales asset, so at the time of inspection a similar office building was under construction at the Durham operation.

The new plant is served by the Southern railroad and has adequate highway facilities to Durham and the neighboring rural and urban communities.

In building the plant the essential productive units were so installed that high quality and high production could be stressed at the outset. Unnecessary frills were dispensed with and additions are being made to pay for themselves. The basic design is such that within a few years the Adams brothers hope to make this operation one of the show plants of North Carolina. This was the first new plant to go into operation in North Carolina during 1952. The yard is being paved as time permits.

A four-way ground storage system is used with a reclaiming belt operating in a tunnel under the cross-shaped storage piles. A Besser Vibrapac is the production unit and it is served by a skip which follows a 50-cu. ft. Besser mixer. The mixer is totally enclosed so as to reduce dusting. There are four kilns with counterbalanced doors, each holding 2500 standard 8's, with steam being supplied by a 100-hp. Littleford steam generator. Low pressure steam curing is practiced. The weigh batching equipment is all Heltzel with aggregates handled to and from the ground storage system by belt conveyors. Solite, an artificial lightweight aggregate made by Southern Lightweight Aggregate Co., Richmond, Va., is the preferred aggregate; however, some hard aggregate block are made. Bulk cement is used. A Clark fork lift truck and a Truck-Man platform unit round out the mechanized equipment.

The Adams family consists of T. Floyd Adams, Sr., Thomas F. Adams, Jr., James D. Adams, Fred H. Adams, and Roderick Adams. Roderick, James D., Fred H. and Thomas F., Jr., are owners of the Durham operation. The


Heltzel BUILDS IT BETTER

HELTZEL HELPS
CONSTRUCTION DOLLARS
GO FURTHER

NASSAU DOCKS, INC.
REORDERS HELTZEL BINS
Often empties over
3 bins per hour

PROBLEM: To have overhead storage of 1½", ¾", ⅜" stone and run-of-crusher limestone screenings which are delivered in barges; to fill and empty the bins quickly into trucks having 14 to 16-yard capacity; to deliver aggregates in proper proportion from the same bins to an asphalt plant on a conveyor belt. These were the Nassau Docks, Inc., problems.

SOLUTION: Nassau Docks, Inc., ordered four 18-foot diameter, 150-ton capacity Heltzel bins, and at a later date, six more. A two and one-half yard clam-shell loads the bins. For discharging, double-acting clam-shell gates (16" x 16") operate from the ground level. During busy days at Nassau Docks, three or more bins are emptied per hour. The superintendent says that any one of 4 aggregates, or any combination of them, can be moved on the conveyor belt to the asphalt plant.

● Nassau Docks, Inc., furnishes aggregates for its own asphalt plant, for contractors and Hendrickson Brothers, with whom Nassau Docks is allied. Specialized Heltzel engineering features circular and square bins; 50-degree sloping sides of cone; a choice of clam-shell, single arc or roller gates ranging in size from 12" x 12" to 30" x 30" which are air or manually operated.

Ease of assembly is testified to by steel erectors time after time. Heltzel has solved hundreds of similar problems effectively; so why don't you write regarding your storage, loading, mixing, unloading, batching or materials handling problems?

Heltzel BUILDS IT BETTER
The Heltzel Steel Form & Iron Company
Construction Equipment Since 1910
WARREN, OHIO
Flex-Plane

family ownership of the other plant is such that Thomas F., Jr., is not a partner in the Fuquay-Varina operation, and Thomas F., Sr., is not a partner at Durham. Otherwise the family group are partners in the two operations. The Durham operation is under the management of Roderick Adams with Fred H. Adams acting as superintendent.

## New Concrete Association

TEXAS READY MIXED CONCRETE ASSOCIATION was recently organized by a group of Texas ready-mixed concrete producers. An association office has been established at 907 Congress Ave., Austin, Texas, with C. S. McLellan as executive director. Mr. McLellan previously served ten years as a member of the Texas Legislature and for the past year has been executive director of the Texas Aggregates Association. He will serve as executive director of the two associations.

The first officers to serve the association are: H. M. Lacy, Gifford-Hill & Co., Dallas, president; Lawrence Fuqua, Houston, vice-president; Scott Clark, Port Arthur, vice-president; and L. W. Dunn, Fort Worth Sand & Gravel Co., Fort Worth, secretary-treasurer. Directors elected were: Thomas L. Amis, Dallas; J. E. Motheral, Austin; Weaver Cunningham, Odessa; Norman Fox, Harlingen; and R. J. Rayzor, Galveston. Thomas L. Amis, Wamix, Inc., Dallas, is chairman of the legislative committee.

## Products Companies Merge

THE BUILDER'S BLOCK CO., Walla Walla, Wash., and the Othello Cement Products, Inc., Othello, Wash., have merged and will operate in Othello.

## Concrete Pipe School

THE AMERICAN CONCRETE PIPE ASSOCIATION held its Second Annual Short Course School of Instruction at the Sherman Hotel, Chicago, Ill., November 20-22, 1952. The school was under the direction of John G. Hendrickson, research engineer, American Concrete Pipe Association.

The Thursday morning session consisted of a welcome by Ivy H. Smith, association's president; an introduction, by Mr. Hendrickson; and talks by H. F. Peckworth, managing director, on A.S.T.M. specifications, and John Ruhling, on the A.C.P.A. Washington office. The afternoon session included speeches by P. H. McGauhey, University of California, who spoke on "Concrete Pipe in Sewer Construction," and R. Robinson Rowe, California Department of Highways, who spoke on "Concrete Pipe in Culvert Construction."

The classes conducted on Friday concerned the selling and promotion of concrete pipe. The school's final session on Saturday morning was devoted to a panel discussion on manufacturing problems.

## Army Concrete Masonry Construction Manual Revised

NATIONAL CONCRETE MASONRY ASSOCIATION recently announced the publication of the revised edition of the document "Design and Construction Procedures for Permanent Construction Utilizing Concrete Masonry Units," as issued by the Office of the Chief of Engineers.

The principal changes incorporated in the revised edition were listed by N.C.M.A. as follows:

Section A: (1) b. The American Standard Building Code Requirements for Masonry has been adopted as the basis of design for masonry construction.

(2) a. The top 8-in. course of concrete block foundation walls is to be a reinforced bond beam.

(2) d. The requirements as to joint reinforcement are defined more specifically and now read as follows: "Joint reinforcement should be located at approximately equal vertical spaces with at least one layer below a windowsill level and one layer above a lintel level. The reinforcement shall consist of two $\frac{3}{8}$-in. side wires with laterally extending weld-connected ties of not less than No. 9 gauge wire spaced not more than 16 in. apart, the lateral ties being designed to insure proper positioning of each longitudinal member continuously in the approximate center of its respective face shell mortar bed. In exterior walls, joint reinforcement should have a minimum protective cover of mortar of at least $\frac{5}{8}$ in. after tooling of the mortar joints. Longitudinal wires shall be lapped not less than 32 diameters at splices and be bent and lapped at all corners. The wire shall be cold-drawn steel conforming to A.S.T.M. Specification A 82-34 except that the ultimate tensile strength shall be 100,000 p.s.i."

(5) b. In regard to control joints, preference is to be given to joint details which provide for load transfer across the joint in shear. Control joints for relieving contraction and other stresses in the masonry will provide a continuous vertical separation through the wall thickness including applied rigid finishes. Such joints should be located, designed and built to perform their stress-relieving function effectively without jeopardizing the lateral stability of the wall. Preference should be given to joint details which provide for load transfer across the joint in shear. Where masonry walls are designed to span from pilaster to pilaster, control joints should generally be located in the center of the pilaster to avoid locating the plane of weakness in the span.

(7) c. This is a new paragraph on dimensional coordination in design which should effect an optimum use of standard size masonry


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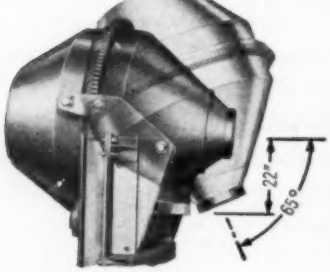
"TILT-UP" MIXER

CUTS PLANT HEIGHT AS MUCH AS 8 FEET

Burmeister's patented "tilt-up" feature—which reduces the mixer's headroom requirement—permits lower plant heights. This means easier crane loading, lower power costs, lower initial costs, less costly "conversions," increased portability, and better over-all control.




● In addition to reducing plant height, Burmeister's 3 cu. yd. "Tilt-Up" Mixer (left) provides a steeper 65° discharge from one spot, eliminates segregation of concrete and the danger of accidental discharge. It is simple to install, and has an integral hydraulic system—no compressor is required. Write for name of your nearest Burmeister Distributor, without obligation.

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# COMMENT
*from the*
## BUTLER ENGINEER

### 3 Butler Plants Save U. S. President's Salary

They don't use timber today to shore-up mine tunnels — ("drifts" to the initiated.) Concrete linings are what the well-dressed mines will wear; concrete mixed by Butler Plants, of course.

Here's the story: Cleveland Cliffs Mine Co. is rehabilitating old copper and iron mines in the north Michigan peninsula. It's an amazing operation. Beautiful grounds landscaped like Aladdin's garden. Highly modern housing developments and fine, well-planned streets and highways.

But most modern of all are the concrete lined tunn—well, drifts, some of which are deep enough to make Satan move his feet. Concrete means safety and economy. Three Butler Ready Mixed Plants do the pouring. They save a dollar a barrel over bag cement. That's enough to pay the salary and tax-free emoluments of the President of the U.S.A. I'm sure this gives H.S.T. a feeling of real security until January.

•

There's a new bridge under construction across the Hudson River north of the George Washington span. It carries the Thru-way from the Great West to the Stork Club and the Copacabana. Rated as one of the great bridges of the world —traffic-wise and in length, it owes its sound footing and the span of its future to a Butler Mixing Plant which, floating on the Hudson, pours concrete for the foundations.

•

*Obviously Butler Plants are at work just about everywhere. I'm planning a Butler Plant to pour concrete runways for flying saucers, but don't say anything just yet. I have a reputation to protect.*

This year let's everybody vote.

*The Butler Engineer*

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN


units with resulting economies in construction. It reads as follows: "Insofar as consistent with other requirements, masonry wall heights and lengths, sill and lintel heights, location and size of openings, and related architectural and structural features should be dimensionally coordinated with the maximum use of standard-size masonry units and the minimum use of special fractional size units. This objective will be achieved most fully with modular design, based on an 8-in. module where modular-size concrete masonry units and ⅜-in. wide mortar joints are employed."

Section B. (2) b. This is a new paragraph requiring square-end units where units abut concrete columns, to permit adequate anchorage.

## Pipe Company Expands

LOCK JOINT PIPE CO., East Orange, N.J., producer of reinforced concrete pressure and sewer pipe, is adding a three-story, steel-frame office building to its present headquarters. To be used for engineering administration offices, the building will add 14,400 sq. ft. to the present floor space.

## Concrete Masonry Demonstration Homes

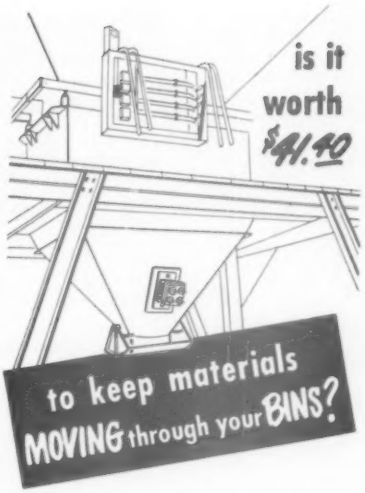
THE PORTLAND CEMENT ASSOCIATION recently published a new brochure entitled, "Concrete Masonry Demonstration Houses," which sets forth various steps to be considered by manufacturers when planning a demonstration house for promoting the use of concrete masonry in residential construction. The brochure outlines four important steps:

1. *Planning.* Building plans should be discussed with leading builders, contractors and architects; the location selected should be in a good, rapidly-growing neighborhood; the architect selected should be one of prestige and one who has an interest in concrete masonry construction.

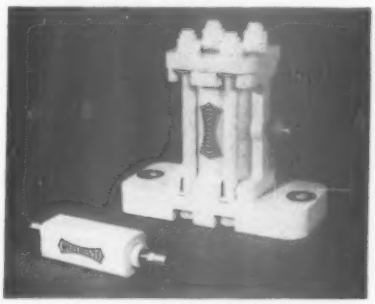
2. *Building.* The type of house and construction selected should comply with local building code requirements; a variety of colors and several exposed concrete masonry patterns in the interior of the house should be shown; financing should be through a prominent local bank, saving and loan association, or other well-known local lending agency, furnishing a list of prospects.

3. *Showing the house.* All visitors to demonstration houses should be routed to pass the portion of the house left exposed to show construction details; an attendant should be present at all times to explain the construction and its advantages over other types of materials; names of prospects should be taken and appropriate literature distributed; contractors and builders should be invited to act as hosts.

4. *The follow-thru.* All prospects should be contacted by architects, builders and contractors.


That's all it costs to install a 1¼" FAC Cleveland Air Vibrator on a way batch hopper of approximately 2 cubic yards capacity. The price shown includes accessory equipment such as lubricator, valve and hose.



That's all it costs to absolutely *guarantee* that your sand, gravel, cement, concrete, or other aggregate materials move into, through and out of bins, hoppers, chutes, screens, storage tanks, etc.

All Cleveland Air Vibrators can be installed for either intermittent or continuous operation.

These and other type Cleveland Air Vibrators are being used economically and successfully every day in many concrete products processing plants.

Standard metallic impact and quiet air-cushioned types.

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". . . After six years at approximately 10 hours per day steady running I find it necessary to rebuild the majority of gears, sprockets and other movable parts on one Truck-Man and prepare to do so on another . . ." says Cement Block Industries, Coral Gables, Florida.

What more need we say? That last statement works out to approximately 18,000 hours of trouble-free operation. What would the record show if they had been using the *new* Truck-Man with its husky 5.8 h.p. Wisconsin engine? It's Truck-Man's low weight to payload ratio combined with rugged power that makes possible its unequalled efficiency in block-plant operation. You burn only a gallon of gas on most 8-hour shifts yet spot the heaviest racks in jig-time. Rubber cushioned ride, hydraulic lift, smooth start and stop mean no costly chocking of blocks. Lower costs from purchase through maintenance and big savings in manpower—everyday—for years—make Truck-Man your *first* necessity for block handling. Available in skid, pallet, platform and *New* tractor models.

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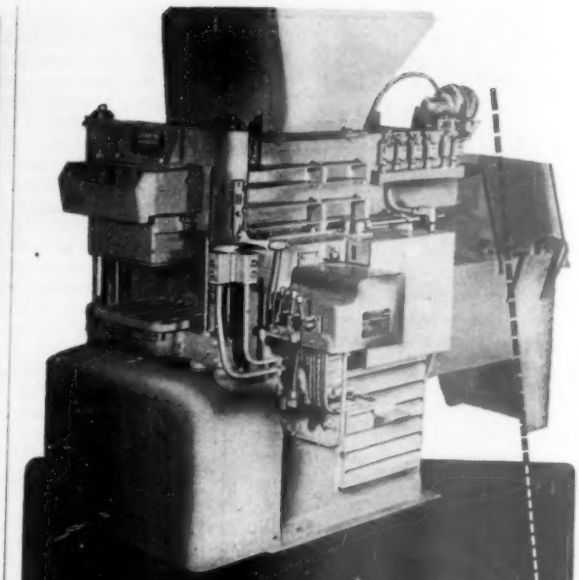

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"LEAD the FIELD"

...IN LOW INITIAL COST... HIGH PRODUCTION AND ECONOMY OF OPERATION

**FROM COAST-TO-COAST,** operators find the Columbia line a leader in its field! Its compact, rugged construction assures longer performance under most severe operating conditions ...moving, rotary parts are made with needle bearings, hardened pins and enclosed within the machine for protection from grit.

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**CANADA CUBA ETC.**

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Stearns Joltcrete No. 7 Block Machine complete, in good running condition—Elec. switch boxes, extra vibrator motor—two 8" mold boxes & pressure heads—one 4" mold box & pressure head—pressure heads for 8" corners, sash, pilaster and bull nose blocks—cores & pressure heads for 8" halves in commons, corners, sash and bull nose—4200 4" steel pallets—2900 8" steel pallets—450 8" corners pallets—200 8" sash pallets—150 8" pilaster pallets—600 8" half pallets for commons, corners, sash, bull nose,—check plates & attachments for 8" bull nose—both round and single round corners—one Stearns Hydraulic Off Bearer—all cleaned & ready for immediate use. Phone or write Frederick G. Smith & Company, 327 E. Stephenson St., Freeport, Illinois. Phone Main 3700.

## FOR SALE

Stearns No. 7 Jolterete, control boxes, automatic carriage, height control, 4"-8"-12" attachments complete with modular pressed steel pallets, pallet dunker, turntable, Kent No. 2 continuous mixer.

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3 Concrete mixer trucks, complete
**MIXERS**—Ransome 3 yd., 4¾ agitator Hercules gasoline motors. Hi-Dump. New paint. A-1 condition.
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UNBREAKABLE
**PALLET RINGS**
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

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One — No. 9 Stearns Joltcrete Block Machine complete with Dual Vibration, power carriage & air operated offbearer, 4" & 8" modular 45% attachments and press steel pallets. 60—Chase #294 steel racks & 2—76" turntables. Excellent condition, located in North Carolina. Also 1—Stearns 28 c.f. mixer and 1—Stearns vertical skip loader, located in Virginia.

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**PRESSED STEEL PALLETS**
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**Send tracing or pallet for quotation.**
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**Overhead sand bin with Elevator**

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1—28 cu. ft. Stearns Skip Hoist
1—28 cu ft. Stearns Mixer
62—Steel block racks
1—Lee Bros. Tile Machine, complete with mixer, conveyor, racks, and attachments for 6" - 8" - 10" - 12" and 14" tile.
2—Lift Trucks
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All equipment in perfect condition.
Reason for selling, disbanding Partnership.
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## FOR SALE

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**PACKER-HEAD WINGS**
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1 Westinghouse 25H, 220 Volt, 3 Ph, 1160 R.P.M. Motor
1 Dunbrick Plant complete with Splitter.

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**CEMENT COLORS**
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73 Delevan St. Brooklyn 31, N. Y.

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One of the best ways to develop this "extra" market is to promote sound construction practices. You'll find it's good business to make frequent calls at job sites—encouraging builders to follow these simple steps:

1. Build exterior wall to the height of a floor, including one course of 4″ solid concrete block.
2. Erect formwork of parallel planks for supporting filler units and concrete slab.
3. Lay rows of block on planks, with cores running horizontally. Joints between block in adjacent rows may be staggered or continuous.
4. Install reinforcing bars for cast-in-place joists as per design table.* Place conduits for wires, ventilating, plumbing and heating.
5. Set a continuous strip of 1″ waterproof insulation board—as deep as the floor is to be—around the outside edge of the floor.
6. Place concrete for joists and slab and moist cure 5 to 7 days. The floor is an ideal base for any finish desired. The flat underside can be painted, plastered or left exposed as desired.

*Write for helpful free booklet on design and construction of concrete block joist floors. Sent only in United States and Canada.

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A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work


## INDEX TO ADVERTISERS IN THE CONCRETE PRODUCTS SECTION OF ROCK PRODUCTS

SEE INDEX OF ROCK PRODUCTS SECTION ADVERTISERS ON PAGES 214, 215


Andersen Sand and Gravel Co. 203

Belle Plaine Block and Tile 203
Berg Vault Company 202
Besser Manufacturing Co. 200
Blue Ridge Talc Co., Inc. 203
Builders Supply Company 203
Burmeister, L., Co. 196
Butler Bin Company 197

Cameron, Joyce & Schneider, Inc. 203
Cedar Rapids Block Company 200
Cleveland Vibrator Company 197
Clipper Manufacturing Company 205
Columbia Machine Works 198
Concrete Specialties Inc. 203
Cook Bros. Equipment Company 193
Crosby, Chas. 203

Dur-O-wal Div. 200

Fleming Manufacturing Co. 202

General Concrete Equipment Co. 203
Gerlinger Carrier Company 201
Grays Ferry Brick Co. 203

Haynes Products Co. 203
Heltzel Steel Form & Iron Company 195

Jackson & Church Company 206
Jaeger Machine Company 172

Kent Machine Company 199
Knickerbocker Company 198

Landers-Segal Color Co. 203
Lith-I-Bar Company 174
Lone Star Cement Corporation 176

Moody, Guy D. 203
Multipack, Inc. 190
Multiplex Machinery Company 190

National Concrete Masonry Association 175

Pontiac Concrete Co. 203
Penn-Dixie Cement Corporation 199
Portland Cement Association 204

Radel, J. M., Trucking, Inc. 203
Rapley, H. G. 203
Rehberger, Arthur & Son, Inc. 194
Reichard-Coulston, Inc. 202

Smaldone, Albert J. 203
Smith, Frederick G., & Company 203
Solvay Process Division, Allied Chemical & Dye Corporation 200
Steinkamp & Company, Inc. 203

Texas Foundries 203
Tile-Crete Products Co. 203
Trinity White Div., General Portland Cement Co. 201
Truck Man Division 198
Truck Mixer Manufacturers Bureau 191

Volz Concrete Materials Company 203

Weeks Concrete Products 203




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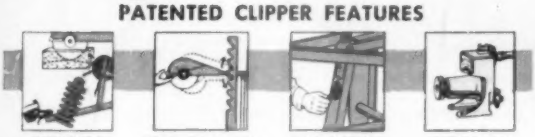
Yes, you can slice through the hardest materials in seconds with a CLIPPER MASONRY SAW. Smoother, faster cutting action than ever before. Contractors agree on the new WET or DRY cutting MODEL HD for the 100% Answer to ALL masonry cutting problems. Actually the HD is "4 SAWS in 1"—it will meet your DUSTLESS cutting requirements in confined areas, it will cut DRY for outside operations, it can be "CONVERTED" to a (Light Duty) *Concrete Saw* and a *Track Saw!* Yes, now greater profits than ever before with a "CONVERTIBLE" Clipper Masonry Saw!

### PATENTED CLIPPER FEATURES



PRESSURE EQUALIZER | SELECT-A-NOTCH | SAVE-A-BLADE DIAL | WET-OR-DRY PUMP

With a Clipper on the job masonry cutting is easy . . . just place the material on Conveyor Cart . . . the *SELECT-A-NOTCH* instantly sets cutting head for material size. A quick setting of the *Save-A-Blade Dial* and the *Pressure Equalizer Spring* automatically cushions the blade for faster cutting —longer life. During DUSTLESS cutting the *WET-or-DRY PUMP* delivers the exact flow of water and when switching to Dry cutting the belts need not be disconnected.

### . . . NOW YOUR CLIPPER IS "CONVERTIBLE"!

At any time the cutting head of your Model HD Clipper can be placed on the "CONVERTIBLE" CART...you're ready to saw concrete or asphalt patches or trenches. No more fractures beyond removal lines—no spalling! But there's more ...just set the CART on TRACKS and operate as a TRACK SAW on stone slabs. The Clipper "CONVERTIBLE" is an exclusive Clipper design.

① DRY-Masonry Saw

② WET-Masonry Saw

Light Duty CONCRETE Saw ③

④ TRACK Saw

**4 SAWS IN 1**

### Sold on FREE TRIAL!

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for fast, efficient curing.

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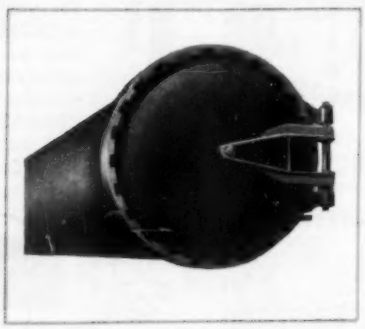

### J-C TURNTABLE

speeds loading at the press or cubing and stockpiling in the yard.

Easy to operate. Rotates on large diameter (6") wheels. Available in table diameters of 5, 6, 7 or 9 feet.

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25 to 30% greater production
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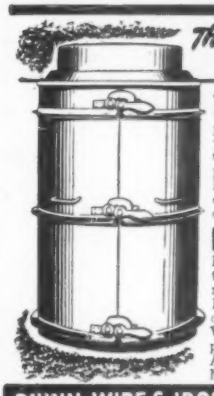

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***Avoid delays in your production schedules!***

**We carry in stock for your immediate requirements, Conveyor Belting in widths from 8 inches to 48 inches.**

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|---|---|---|---|---|
| 8" | 4 | 1/16" | 1/32" | 28 Oz. |
| 10" | 4 | 1/16" | 1/32" | 28 Oz. |
| 12" | 4 | 1/16" | 1/32" | 28 Oz. |
| 14" | 4 | 1/16" | 1/32" | 28 Oz. |
| 16" | 4 | 1/8" | 1/32" | 28 Oz. |
| 18" | 4 | 1/8" | 1/32" | 28 Oz. |
| 20" | 4 | 1/8" | 1/32" | 28 Oz. |
| 20" | 5 | 1/8" | 1/32" | 28 Oz. |
| 24" | 4 | 1/8" | 1/32" | 28 Oz. |
| 24" | 5 | 1/8" | 1/32" | 28 Oz. |
| 26" | 5 | 1/8" | 1/32" | 28 Oz. |
| 30" | 4 | 1/8" | 1/16" | 32 Oz. |
| 30" | 5 | 1/8" | 1/16" | 32 Oz. |
| 30" | 6 | 1/8" | 1/16" | 32 Oz. |
| 36" | 6 | 1/8" | 1/16" | 32 Oz. |
| 42" | 5 | 1/8" | 1/16" | 32 Oz. |
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Power & Mining double roll crushers, 24" dia. 14" face
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Jaw crusher Climax 10"x16"
Five overhead electric AC hoists
Chicago, size 12, 3 ton airhoist
Double drum tandem hoist
Electric 15 hp car puller
Sullivan HE 7½ hp electric hoist.
Jeffrey 30" wide 30' long apron conveyor in frame
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Merrick Scales for 16" and 30" belt
Screw conveyors and vibrating feeders
Enclosed ceiling conveyor, 14" flat belt
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Motors, reducers, engines, gears, V belt drives
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42" belt conveyor equipment for 200'
36" belt conveyor equipment with belt for 350'
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Enclosed 16" bucket elevator, 40' center
Open 16" spaced bucket elevator, 92'
Cont. 12" and 14" bucket elevator 50'
Open bucket elevators on chain or belt.
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EXTRA IDLERS, TERMINALS & BELTS.

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1—4'x20', 2—4'x45'.
1—6'x60', 2—5½'x7'x60'

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65 TON WHITCOMB DIESEL ELECTRIC.
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30 TON INDUSTRIAL GAS.
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48 x 60 SUPERIOR JAW CRUSHER.
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CRUSHERS: Gyratory 30", 36", 42", and 48". Nos. 12, 10, 9, 7½, 6, 5 Allis-Chal. and others.
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Gravel plant, 125-ton per hour capacity consisting of six wood bins, one 48" x 26'6" triple jacket revolving screen, two vibrating screens, two sand separators, one 4' Symons Cone crusher, one roll crusher, one 8" centrifugal pump, 16" to 30" material conveyors. All plant equipment individually motor driven. Plant located adjacent to railroad on twelve acre tract, 3250' of loading tracks.

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HI-PRESSURE

### PUMPS

| GPM | Make | Type | Head |
|---|---|---|---|
| 800 | Worth | 6DS | 925 ft. |
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7'x160'x⅝". (2).
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7'x60'x⅜" with lifters.
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60-ton, 2-comp., 8'x18' storage bin w/clam gates. Special bins to your specifications.
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Osgood 1 ¾-yd. Model 906, diesel powered.
Lorain 75, 1¼-yd. diesel.
Lorain 30 truck crane on Mack 10-wheeler.

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Sanderson-Cyclone No. 42 well drill, new.
Sanderson-Cyclone No. 41 well drill, new.
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45" Ohio lifting magnet, rebuilt.

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28FD rear dump Euclids.

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500 cu. ft. Gardner-Denver diesel, rebuilt.
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Worthington 2-stage, water-cooled, vertical 250#, 60 CFM, new condition.

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8" Hydraulic. Diesel. On 32'x8' steel pontoons.
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Large plant 2½ yd 6 compts. agg. & cement elevators, 56-S Mixer.
Large plant 400 yds 5 compts. two mixers
NEW F-S 100 ton agg. bin 3 compt.
NEW F-S 400 bbl. cement bin complete.

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Iowa Model 2A Crushing and Screening plant.
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Pioneer 54-VA Port. with 12"x24" jaw crusher.
Telsmith Primary Port. 23"x36" jaw crusher Diesel.
Pioneer Secondary Plant. Port. 100 T.P.H. 1¾".

### CRUSHERS

**JAW:** Acme 10x20, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40. Eagle 20x36. Diamond 24x36". Cedar Rapids 10x20, 20x36, 25x40. Farrell 10x20, 12x30, 14x36, 18x36, 36x48. Buchanan 36x42. Good Roads Reliance 15x30. Traylor 18x36, 24x36. Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Champion 1030, 1040, 1236, 1530.
**GYRATORY:** Allis-Chalmers-McCully, 6", 7½", 8", 9", 12½, 20", 30", 42", 14", Newhouse, 24", 36", Gyrasphere, 18", 28". Intercone Telsmith, Telsmith 5H, 10-H, 13-H, 16-H. Kennedy Van Saun 7, 19, 25½-S, 37. Traylor Ty 1'8". Ty 2'4", T 4½".
**ROLL:** Allis-Chalmers 54x24. Diamond 40x22. Pioneer 30x18. Telsmith 24x16. Pioneer 30"x18". New Holland 24x16.
**HAMMERMILL:** Size 4 Williams Jumbo, Pennsylvania 8X2, 22x22. Cedar Rapids 20x33. Jeffrey 36x42, Jeffrey 36x24, 36x40. Dixie 3650.
**BALL MILL:** Allis-Chalmers 4'x4', 5'8"x18'. Kennedy Van Saun 7'x5'. New 4'x4'. Hardinge 6'x4'; Colorado Iron Works 5'x6'; Marcy No. 64½. Hardinge conical 10'x36".
**ROD MILL:** March 2'x8', 3'x6'. Allis-Chalmers 4'x8'. Hardinge No. R 206. Marcy 8'x12'. Hardinge 8'x22'.
**CONE:** Symons 2' coarse bowl, 4' standard coarse bowl.
**TUBE MILL:** Smith 16B 5'6"x20', Denver 3'x8".
**DRIERS:** McNeil 5'x50'. Hardinge 90"x60'. Cummer 60"x50'. Perkins 8'x70', 10'x90'.

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N-W 80-D 2½ yd. Dragline. Diesel. 100' boom.
N-W Model 6, 1½ yd. Diesel Shovel.
Lima Mod. 34, 1 yd. Shovel-Crane-Dragline. Gas.
Link-Belt K-375 2 yd. Diesel Dragline.
Northwest 80-D Diesel Shovel 2¼ yd. Recond.
Link Belt K580 Shovel. 1948—practically new.
P&H Model 855, 2 yd. Diesel Shovel.
Bay City 45 Shovel-Backhoe-Crane. Diesel.
Lima 1201, 2½ yd. Diesel Shovel.
Lorain L80 Shovel. 1¾ yd. complete overhaul.
Link Belt K-505 dragline, 2¼ yd., 8 ft. boom.
Lima 802, Shovel-Crane-Drag. 2 yd. Diesel.
Koehring ⅝ yd. Diesel Shovel.

### SCREENS AND FEEDERS

Symons 4'x10" 3 deck.
Symons 4'x14' double deck
Tyler Hummer 3'x5' with motor generator.
Acme 5'x12' Revolv. Scrub-Scalp Screen.
A-C 5'x14' 2 deck riple-flo.
Robins 4x14 Vibrex Double Deck Screen.
Traylor Apron Feeder 5'x15', heavy duty.
Reciprocating Feeder 4'x19', with motor.

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Cat. D7 Traxcavator. Rebuilt.
Cat. D6 Traxcavator. Rebuilt.
Cat. D4 Traxcavator. Rebuilt.
Cat. D2 Tractor 50" Traxcavator. Rebuilt.

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45 ton G.E. Diesel Elec. Loco. std. ga.
25 ton Plymouth gas loco. std. ga.
12 ton Plymouth gas loco. std. ga.
8 ton Plymouth gas loco. std. ga.
25 ton Vulcan steam std. ga. Side tank.
15 ton Whitcomb 26" ga. gas.
12 ton Whitcomb 36" ga. gas.

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American Terry 20 ton Guy Derrick 100' bm.
Clyde 30 ton stiff leg 90 ft. boom.
Guy Derrick 15 tons 115' mast 105' boom
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Special 35 ton stiff leg derrick 100' boom.
American Model 10-80, 20 ton Guy.
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The services of a design engineer, mechanical preferred, are required by large organization in Montreal, Canada. Must be thoroughly familiar with portable and permanent crushing plants, asphalt plants, ready-mix concrete plants and all types of road building equipment, with eight or ten years' experience in this field and with engineering degree or equivalent. Permanent position if applicant qualified. Please give age, experience and references and state salary expected. All replies will be treated in strict confidence. BOX L-22, ROCK PRODUCTS, 309 W. JACKSON BLVD., CHICAGO 6, ILLINOIS.

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Crescent Type NBR-6 Electric Drop Frame Carrying Truck — 6000 lbs. capacity — platform 38x72" — solid rubber wheels — powered by Type H-36 Ready-Power Gas-Electric unit — location Ohio.

**THE STANDARD LIME AND STONE CO.**
2000 First National Bank Bldg.,
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Buckeye Clipper No. 70 ¾ yd., Combination shovel, dragline and clamshell — Frastball and many repair parts. 4 years old. Price $6500.00

**SANDERSON & BAUER**
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**$1500.00 and up**

Complete bulk fertilizer handling and storage equipment.

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One Chicago Pneumatic Wagon Drill with two Drifters.

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Complete dipping plant, consisting of one 95 ft. steel mast, two ¾ yard buckets, hoist, track line cable and all other cables is as good as new.

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**CONSULTING ENGINEERS**
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***Specialized Engineering Services for Lime, Crushed Stone, Sand & Gravel and Other Non-Metallic Industries***

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24" x 50" Good Roads Model 20F

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Factory Rebuilt Mack Diesel Engines, 510 cu. in. displ. 138 hp at 2400 rpm. Dynamometer tested ready to run. Hydraulic governor ideal for 100 k.w., MG sets, pumps, crushers, *etc*. $2150. Also complete used — $825, and 165 hp @ 2000 rpm diesel — $875. P. O. Box 292, Basking Ridge, New Jersey.



**FOR SALE**

BUDA DIESEL POWER UNIT. MODEL 8DC1125. 8 CYLINDER, 240 MAXIMUM H.P., USED LESS THAN 1500 HOURS. A REAL BUY. E. LeRoy Klinger, Elizabethville, Penna., Phone 159R3.



**FOR SALE**

1—D4 Caterpillar with Trackson Loader. Machine in A-1 condition.

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Phone: 775-J



**"Sales and Service Men Wanted"**

Large Concrete Block Plant Equipment Manufacturer Knowledge of concrete products plants, and some mechanical knowledge required. Education need not exceed high school. Past record must be up to high standards. All replies held confidential and a photograph would be appreciated. Choice locations in the U.S still available. Company now expanding into foreign markets. Box L-13, Rock Products, 309 W. Jackson Blvd., Chicago 6, Illinois.



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The permanent services of a graduate engineer are required by a long established company in a Midwestern state. The applicant must have several years experience and complete working knowledge of the operations and equipment of a commercial rock quarry. Give age, experience, references and salary required. BOX L-24, ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Ill.



**FOR SALE**

1 COMPLETE PORTABLE PRIMARY AND SECONDARY ROCK CRUSHING PLANT, WITH ALL EXTRA EQUIPMENT.

LYLE ALLEN
HOPKINTON, IOWA



**FOR SALE**

60 HP prime

**DIESEL ENGINE**

Made by Power Mfg. Co., type J, speed 277 RPM.

The Asbury Graphite Mills, Inc.
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**FOR SALE**

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___Aggregates (special)
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___Air Separators
___Asphalt Mixing Plants
___Bagging Machines
___Bags
___Barges
___Batchers
___Belting, Conveyor, Elevator, Power Transmission
___Belting, V-Type
___Belt Repair Equipment
___Bin Level Indicators
___Bins and Batching Equipment
___Blasting Supplies
___Block Machines Concrete Building
___Bodies, Trailer
___Brick Machines and Molds
___Buckets
___Bulldozers
___Cars, Industrial
___Classifiers
___Clutches
___Coal Pulverizing Equipment
___Concentrating Tables
___Concrete Mixers
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___Concrete Waterproofing and Dampproofing
___Conveyors
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___Drilling Accessories
___Drills
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___Explosives & Dynamite
___Fans & Blowers
___Flotation Equipment
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___Generator Sets
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___Gypsum Plant Machinery
___Hard Surfacing Materials
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___Kilns: Rotary, Shaft, Vertical
___Locomotives
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___Masonry Saws
___Mills
___Pulverizers
___Pumps
___Scales
___Screen Cloth
___Screens
___Scrubbers: Crushed Stone, Gravel
___Shovels, Power
___Speed Reducers
___Tanks, Storage
___Torque Converters
___Tractors
___Tractor Shovels
___Trailers, Dump Body
___Truck Bodies, Dump
___Trucks, Industrial
___Trucks, Mixer Body
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